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# Computer Weekly

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Thursday, March 22, 1984

## US giant grabs RTZ software

by John Kavanah  
US FINANCIAL software firm McCormack and Dodge is buying its UK agent, RTZ Computer Services' software division, as its first step towards worldwide expansion through takeovers.

And the remaining bureau and consultancy side of RTZ will use the £3.2 million payment to fund its own takeovers and to back moves into the Digital Equipment and IBM Personal Computer software markets.

The deal will give McCormack and Dodge a UK operation based in Bristol with a turnover of £3.3 million, profits of £220,000 and 60 staff - plus RTZ's long-established Fasia fixed assets package.

The staff include directors Paul Methven, who will be managing director, and operations director Ken Trueman. Methven says all staff back the takeover. The headcount will be increased immediately with the addition of extra support staff.

Methven and Roger Miller, managing director of RTZ Computer Services, say the takeover is best for staff, customers and the companies.

"The business has been reasonably profitable since 1980, but not enough for the effort we've put in," says Miller.

Methven adds: "An agent's aim is to make profits. It has to keep a balance between the number of products it introduces and the profit it can make. With our new direct ownership we will substantially accelerate the product introduction rate in the UK and increase our marketing."

Charles Hogan, head of McCormack and Dodge in Europe, says the UK operation could now take on more development work. He is pleased that the deal has given the company the "market leader" Fasia package. RTZ has about 300 Fasia users and 120 McCormack and Dodge customers.

Hogan adds: "All our managers around the world have a brief to look for suitable takeovers in their areas."

Miller will also have about 60 staff in the bureau and consultancy side, although the number will go to 70 soon.

He predicts "quite a few" product and company takeovers by RTZ in the next year. In addition its information retrieval system, run as a bureau service for the Foreign Office, the National Health Service and the Institute of Mining and Metallurgy, is being packaged as a product for IBM Personal Computers users.

McCormack and Dodge is one of the top independent US software suppliers, with a turnover of about \$55 million. With RTZ it is involved in a lawsuit with ABC Management systems over the use of the latter's Past report writer in the GL+ general ledger package. McCormack and Dodge is paying any legal costs incurred by RTZ in the dispute.



METHVEN... "We will accelerate product introduction rate."

## Commodore fails to deliver - and gets a caning

by Nuala Moran  
COMMODORE'S big advertising campaign at the end of last year, which promised to deliver the peripherals other companies could not, has won it a telling off from the Advertising Standards Authority (ASA), in its summary of complaints for January.

Seventeen members of the public complained to the ASA about an advertisement headlined: "What do you want, promises or peripherals?", which claimed that, in contrast to other companies, Commodore had a range of peripherals which were actually in the shops. According to the complainants, this was not the case.

The ASA upheld these complaints saying Commodore was at fault in running a campaign whose major theme was that the featured items were in stock.

Bob Johnson, in charge of Commodore's advertising at the agency Grandfield Rork Collins, says: "It is not our intention to advertise products we don't have. The ad ran just before Christmas, which is a prime time for selling, and we ran out. In other words it was a very successful ad. We shipped out as many as we could but we still couldn't meet the demand."

Acorn was also chastised for failing to deliver the goods. Four complainants attempted to buy the Acorn Electron after seeing a national advertising campaign but were thwarted by non-availability.

Tom Hohenberg, Acorn marketing manager, says: "When we planned the advertising campaign we were expecting to meet demand. When the shortage arose we withdrew the adverts."

Nine other complaints about computer adverts were upheld.

## IBM trade secrets case re-opened

by Keith Holder  
THE IBM trade secrets case, involving the alleged theft of documents for sale to Hitachi and Mitsubishi, has been revived by the San Francisco Appeal Court.

The case against three individuals charged with the theft was dropped in September 1982 when attorneys refused to obey a court order to hand over documents which detailed co-operation between IBM and FBI in mounting the sting operation. That case has been re-opened.

The re-emergence of the case will not please IBM, according to US analysts, as it will focus attention on the role IBM played. IBM declined to comment on the re-opening of the case, and US analysts say that, in contrast to the company's public stance during the original trial, IBM will want to "play it cool" this time.

IBM maintains that co-operation with the FBI is "its duty".

The three defendants are the only ones left in the case.



BLEASDALE... "Flattered."

## Bleasdale joins Alvey project

by Dave Madden  
ALVEY director Brian Oakley disclosed at a financial seminar last week that GEC, ICL, and Ferranti, who have been joined by a fourth and much smaller company to develop a high-performance executive workstation for the project.

And the company has revealed itself as Bleasdale Computer Systems.

According to Eddie Bleasdale, founder, chairman, and managing director of the company, he saw the outline specification for the workstation in the Alvey newsletter.

It was so close to Bleasdale's existing system that he approached the directorate, and now has been invited to participate.

"Basically they are thinking of a Unix machine, designed as a kit of parts with various options - arithmetic processor, high-resolution graphics - and we have been delivering that sort of system for two years now," Bleasdale says.

In effect, Bleasdale is joining GEC, ICL, and Ferranti on a consultancy basis in a pilot study which is due to make recommendations in mid-April.

If they are accepted the working party will begin an implementation based on the Bleasdale system.

Initially, Bleasdale computers used Zilog Z8000 processor, but since January 1983 the company has delivered Motorola 68000-based equipment.

Bleasdale says: "We're extremely flattered. Our inclusion shows that Alvey can get the right small companies involved."

Bleasdale Computer systems recently raised some £600,000 on the London Over-the-Counter stock market in an offer for sale by Harvard Securities.

## Printers spell out deal

by Nuala Moran  
THE printers union, the NGA, has announced its terms for the introduction of new technology in regional newspaper offices. In a policy statement published last week, the union says it will accept single keying of material provided the work is done by union members.

Accepting single keying means that journalists and advertisement staff would have direct access to computers instead of all material having to be input by NGA staff.

The NGA has proposed the setting up of a single "origination" area for each newspaper where all the typesetting would be carried out with a labour force divided between the NGA, Sogat 82, or the National Union of Journalists.

The suggestion was put to representatives of the NUJ and Sogat 82 last Thursday.

Jacob Ecclesstone, deputy general secretary of the NUJ, says: "It's been NUJ policy for six years that we won't negotiate to take over work done by other unions."

The Newspaper Society, which represents regional newspaper owners, says it "welcomes the fact that the NGA has recognised that its members can no longer have a monopoly on input."

## Startax is withdrawn

by Philip Hunter  
STAR Computer Group, the publicly-listed UK systems house, has withdrawn a tax administration software package from the market after being accused of copying it from a rival product.

The group has agreed to withdraw its Startax personal tax administration and planning software package, after discussions with MGB Systems, supplier of the rival Pertax package. But Star has admitted no legal liability.

Michael Edwards, managing director of MGB, says: "We're naturally pleased at the outcome, which highlights the unique position of Pertax in the marketplace."

Star Computer said Startax was developed on its behalf by the third-party software house Anchorsoft. The reason for the similarity between Startax and MGB's Pertax was that a former MGB employee had been working on development, at Anchorsoft, says a spokesman for Star.

MGB has also obtained a guarantee from one of its former employees, C. H. Lim, and the company he now works for, Anchorsoft, which is a subsidiary of Stag. Both parties have agreed to stop marketing Startax.

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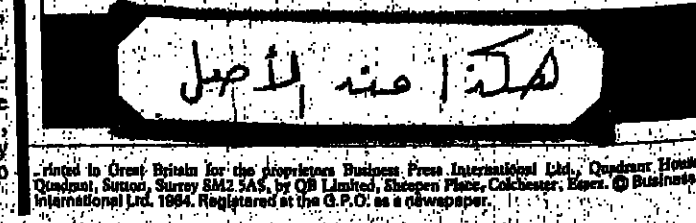
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# Computer Weekly

Thursday, March 29, 1984 Number 904 35p



HENSON... "Our results have been adversely affected by the dollar."

## Prime prices will go up

by John Riley  
US microcomputer manufacturer Prime Computer is to raise its UK prices on April 2. Hardware products will go up an average of 5% and software maintenance charges are to increase 10%. But there will be no increase in hardware maintenance charges.

"The charges are due to increased pressure from the dollar," says Malcolm Padina, Prime's UK managing director. He explains that the company could not have held out any longer.

"Our results have been adversely affected by the dollar," confirms Prime's president, Joe Henson. "I don't see the dollar strengthening further in 1984. If anything, I hope it'll weaken so that there is no need for us to take more pricing action."

Martin Jeffreys, managing director of software house, Wootton Jeffreys, a major Prime distributor, says: "Even with the 5% hardware increase, the equipment is still good value for the money and won't impinge on most people who are buying total solutions."

Prime's turnover last year was \$16 million, up 19% on the previous year. According to Henson, the UK provided about one eighth of that, ie £40 million.

The UK is a key development area for Prime's most rapidly growing segment, computer aided design and manufacture (CAD/CAM). Henson says that CAD/CAM, which brings in about 20% of the company's revenues, grew at the rate of 56% last year.

Prime took over the British CAD/CAM company, Campeda, in November 1983. It markets Medusa, a CAD/CAM package developed by Cambridge Interactive Systems, and last October gained worldwide marketing rights to UK software house Logan Associates' Locam package.

Although Prime acquired design rights for an IBM-PC lookalike device earlier this year, Henson says he has still reached no decision about developing a PC. He explains that he does not see the need for a standalone workstation unless it can be integrated into a network.

"We can attach IBM-PCs into our network system," he says, "but have reached no decision to build our own product."

## AT&T comes to market with mini set

by Dave Madden  
TELECOMMUNICATIONS giant American Telephone and Telegraph (AT&T) burst into mainstream computing this week with a New York launch of a range of minicomputers. DEC shares were suspended on the New York Stock Exchange on the eve of the announcement.

AT&T gave details of six computers, from a \$340,000 supermini to a \$10,000 desktop workstation, all running Unix, which it describes apocryphally as its "official entry into the general purpose computing business with the broadest initial product offering in the history of the industry."

Paradoxically, although this represents AT&T's first shot against IBM in the "baby" has been Digital Equipment. DEC's shares were suspended by the New York Stock Exchange on the eve of the announcement, after DEC's investors fell over themselves to get rid of DEC stock after a Dow Jones comment that the AT&T computers would compete with the DEC Vax (see leader comment). James Olson, AT&T vice chairman, said "AT&T's entry into the computer market means more than just another player on an already crowded field. I believe our entry will add an important new dimension to the computer industry. In fact, over time I believe it will re-define the industry."

DEC was sanguine about the news. A spokesman said "In one sense it is flattering that the Vax is the standard by which everyone else measures themselves, and by which they are measured."

AT&T said that its announcement will be the first of many in 1984. The offering includes six different high performance computers and two networking products; one is a local area network to tie AT&T computers together, and the other a personal computer interface that "brings the Unix operating system to the personal computer world" by allowing all IBM compatible personal computers to talk to each other.

All the systems are built around AT&T's proprietary Bellmac 32, a 32-bit microprocessor, and run Unix Systems V. They will be offered on an OEM basis to "value added resellers" in the US. In Europe marketing will be handled by AT&T International and Olivetti in which AT&T took a 25% stake at the turn of the year.

The top-end machine is dubbed ■ Continued on page 5

## Accounts cast doubt on BT sale

by Dave Madden  
BRITISH TELECOM will publish its delayed 1983/4 first-half financial results this week, but they may not be enough to end City speculation that the state of BT's accounts may yet compromise the government's privatisation plans.

The statement for the six months to last September is expected to show pre-tax profits of around £460 million. But City analysts will be more anxious to see if BT has begun to put its antiquated accounting system in order.

If not, then the government may have serious problems in meeting its timetable for the BT sale.

The government is hoping to raise £4 billion from the flotation, and any delay would seriously upset the Treasury's Budget calculations.

Lord Bruce of Donnington, chief opposition spokesman on BT in the Lords, says: "It is really very simple. For various historical reasons, British Telecom's accounts have been prepared on a varied basis."

"It can't comply with the 1948 Companies Act: it does not have a profit record with comparable figures. If it is compelled, as it ought to be, to meet the explicit requirements of the Stock Exchange and the accounting professions, then it cannot be privatised this year."

"If the law is obeyed then this can't be done."

But the government is determined to go ahead with the sale. ■ Continued on page 2

## ACT is set to take over Victor

BANKRUPT US micro maker Victor Technologies has rejected last minute bids for the marketing and manufacturing rights to its Victor 9000/Sirius outside the Americas, leaving ACT virtually certain to pick up the business. Victor management and creditors have accepted ACT's offer - of undisclosed value but less than the company's outstanding \$40 million debt - and it only needs US federal bankruptcy court approval to seal the deal.

## Tape standard

MANUFACTURERS and users of information technology products have endorsed a set of specifications for magnetic tape products which they want the British Standards Institution to make a UK standard. Other standards will be prepared in the same way if this pilot exercise by the Department of Trade and Industry's Focus Action Group is successful.

## Varsity contract

BIRMINGHAM micro company ACT is negotiating with Birmingham University to set up a purpose-built research centre on university land. A spokesman for the company says the project will go ahead subject to contract and that the university is already seeking planning permission.

## ABC settlement

TOP US financial software house McCormack and Dodge has paid an undisclosed sum to ABC Management Systems to end its dispute over rights to a report-writer. The agreement gives McCormack the right to resume sales of its accounting packages worldwide incorporating ABC's Fast system.

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## Accounts cast BT doubts

From front page  
mined to push the measure through. Lord Cockfield, chancellor of the Duchy of Lancaster, told the Lords on the final day of the report stage of the Telecommunications Bill: "It is the government's firm intention that privatisation should take place this year."

A spokesman for the Department of Trade and Industry says that it is satisfied that the accounts will be in a satisfactory state to satisfy the Stock Exchange. If there is any doubt, then the government will seek exemptions, and use Britoil as precedent.

British Telecom's 1981/2 and 1982/3 statements were both heavily qualified by the company's accountants Coopers and Lybrand, the latter statement after it was revealed in February 1983 that the inadequacy of BT's computer systems had reduced BT to paying invoices on trust.

The latest interim figures should have been produced in January. The delay is understood to have come about to allow the introduction of the new accounting practices which will be used in the final results due in July, and put before the Stock Exchange later in the autumn.

The main change required is to bring BT's policy on depreciation into line with private sector accounting practice. Traditionally, British Telecom has piled heavy supplementary depreciation on to its historic cost accounts.

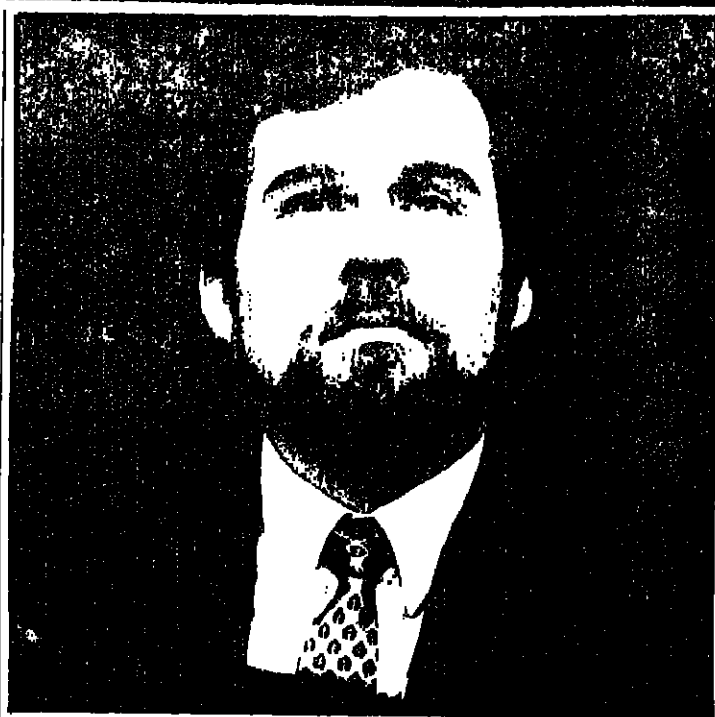
In 1982/3, that brought full-year profits down to £365 million. This year, BT wants to make an even bigger write-down of assets as an exceptional item.

Michael Bean of stockbrokers Henderson Crosthwaite says: "Apart from the depreciation provision, there is also the little matter of how it handles the pension liabilities."

The more cynical City observers expect the government to lean on the Stock Exchange to give BT an easy passage because of its recent agreement with the Stock Exchange on administrative reforms and a favourable budget.

But one stockbroker says: "We've no reason to be kind to the government."

A source in Westminster adds: "Unless they think that distributing MBEs will get it past, then it won't go through."



ROSS... Plans face "horrific" problems.

## MPs travel to see automation

by John Kavanagh  
A GROUP of MPs will visit North America in May to see office automation in action in the US and Canadian parliaments. The visit is part of a review of the House of Commons's automation needs, started a year ago by the all-party computer sub-committee.

Such committees are not normally allowed to go overseas, but last week the Commons voted by 77 to 13 to allow this trip. Barrier plans for the visit had to be cancelled when some MPs objected. This latest decision still has to be approved by a committee of all Commons select committees.

Earlier this month British Telecom won a £1 million contract to supply the Houses of Parliament with a 5,000-line digital telephone exchange made by Plessey. The IDX system will be installed in the autumn of 1985 and will fit in with any office automation proposals.

Last year, consultancy BUI Informatics was called in to study MPs' needs. Dr Gordon Ross, advanced office systems manager at BUI, says the plans face "horrific" funding and organisational problems - but could be worth £5 million to a computer supplier.

The funding problems stem from the fact that MPs have their own office equipment allowances, so some are buying microcomputers.

In addition, the life of the equipment is longer than the life of a parliament.

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## IBM enters the news business

by Dave Madden  
IBM AND US financial group Merrill Lynch have formed a joint venture company to bring financial information to business. The service will be delivered by satellite to IBM Personal Computers, and will lead to IBM competing directly with Telerate and UK financial news company Reuters.

The new company has no name at the moment, but it will begin operations in the first half of the year. A spokesman for Merrill Lynch, known in the US as the Thundering Herd, says the market for its services in the financial community is "incalculable".

According to an IBM spokesman: "The products details aren't settled yet and it is too early to talk about product marketing." But the venture will bring together Merrill Lynch Stock Exchange

news services and software with IBM hardware products. Monchik-Weber, a New York software company, was also involved in the development.

A prototype system shown in New York included IBM host machines and Personal Computers. It was used to track 300 selected stocks and to alert brokers to share movements. The broker can then use the system to place calls to interested clients, and eventually it will include an electronic mail service.

The system will be sold to financial institutions and their larger private customers, starting with Merrill Lynch's own huge brokerage network.

IBM says the company is likely to operate in Europe, but can not say when. A spokesman for Merrill Lynch in New York says it will have to see if there is likely to be an

international market for its products.

In the UK, the company would compete with Reuters, which will not make Reuters' imminent share flotation any easier. The share sale is expected to value Reuters at around £1 billion.

IBM already has an interest in the financial services industry. It is a partner in Satellite Business Systems, a joint venture satellite telecommunications group with Comsat and US insurance company Actua Life and Casualty - a venture which has so far consumed over \$700 million of investment.

Merrill Lynch and IBM have not given details of the investment in the new project, though they will make equal contributions to it.

The venture has grown out of work IBM did in 1982 on Merrill Lynch Financial Services System.

series, showed that many top managers were unconvinced of the need for taking serious precautions against potential disasters, while 76% of data processing managers were aware of the need.

Colin Berthelson, managing director of Fallsafe, one of the UK's largest computer disaster specialists, agrees that top managers need educating. "DP managers are broadly aware of the problem. But they then have to sell the concept in-house," he says.

"We've tried to address the problem by marketing to corporate managers."

Throwing down a gauntlet to his competitors, he says: "Let's all put

some money in the pot and market disaster planning together."

Fallsafe was set up jointly by Atlantic Computers and last, which was formerly called BI Systems, and offers clients an IBM mainframe in the event of disaster. The service costs £45,000-£135,000 a year, depending on the level of security wanted.

A service for ICL users is provided by Fallsafe Computer Services of London, which offers a comprehensive policy, including hire of an ICL 2966.

The only dedicated service for Digital Equipment Vax users is provided by London-based Steiger Computer.

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## UK bosses ignore fire threat

by Philip Hunter  
ONLY one third of top UK managers think there is any need to make special plans for computer disasters such as fire, according to a survey of 500 mainframe installations.

"Many senior executives are still unaware of the growing dependence of their businesses on computers and the disastrous effects that could be caused by a disruption to their data processing," says Alan Mann, manager of Datastore, which carried out the survey and is itself a specialist in disaster planning.

The survey, based mainly on users of IBM's 4300 mainframe

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## Distributor doubles money

by Philip Hunter  
ONE of the country's biggest micro distributors, MBS, doubled its turnover to over £14 million for last year and announced plans to spend £15 million to buy two computer equipment distributors.

MBS is to acquire computer supplies, terminals and micro distributor Data Efficiency for an £11 million combination of shares and cash and UK distributor of Telex terminals, Computer Peripherals, for a similar £3.45 million mixture.

The deals are subject to confirmation by MBS shareholders who are to get 2.25 pence per share this year in dividends. MBS boosted its turnover last year by 111% and put up its profits by 120% to £1.7 million.

The company went on to the Unlisted Securities Market in late 1982 to raise £1.8 million for 26% of its shares.

In 1983 it took over Hull based DEC authorised distributor Alvecon in a £3.4 million deal.

Data Efficiency was once the parent company of Microsense, the company which became Apple UK.

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Colin Berthelson, managing director of Fallsafe, one of the UK's largest computer disaster specialists, agrees that top managers need educating. "DP managers are broadly aware of the problem. But they then have to sell the concept in-house," he says.

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Fallsafe was set up jointly by Atlantic Computers and last, which was formerly called BI Systems, and offers clients an IBM mainframe in the event of disaster. The service costs £45,000-£135,000 a year, depending on the level of security wanted.

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# Star turns clients into micro dealers

by Nuala Moran

MINI systems house, Star Computers, announced last week that it is going for the commercial micro market. And the company is taking a novel approach by getting existing customers to find it new ones.

Star's innovation is to set up the Star Partnership, whereby its user base of over 700 accountants using its mini systems can become dealers and offer services and advice on using micros to their client firms.

The scheme works on two levels: either accountants can recommend clients to Star, in which case they just charge their time for giving advice in the usual way; or they can act as dealers, getting discount which is passed on to the client.

David Blechner, Star's managing director, says: "This notion has fitted in well with the ideas of the top 29 firms of accountants. One of the big eight firms has recommended 23 systems to its clients."

For those clients that are referred to Star, the company has set up the Star Partnership Centres. The first opened earlier this year in Thames Ditton, Surrey, there is another at Star's head office in London and more are planned in the Midlands, the North of England, Scotland and Ireland.

The benefit to accountants is that their market is getting increasingly competitive; that they can offer advice on micros is another string to their bow when vying for business.

Blechner says that the customers

attracted in this way represent a range of businesses and new vertical markets.

Star has released packages for insurance companies, property management and solicitors.

"In particular," Blechner says, "the solicitors' market is showing signs of waking up to micros, and it is very receptive to the turnkey approach."

The company is also signing with Convergent Technologies. Blechner says: "At the moment there is no leading brand name in the multi-terminal area. Convergent has the technology to take first place in this market but it has traditionally only sold through large companies. Star will be selling Convergent machines to dealers, OEMs and systems houses."

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BLECHNER... "The solicitors' market is waking up to micros."

## Sweda launches multi micro for retailers

by Keith Holder

POINT-of-sale systems manufacturer Sweda is about to step into the multi-user microcomputer market with a 16-bit product aimed at its existing retail user base and small business users.

The company estimates that it has cornered 38% of the retail market with its existing products.

Its Sweda Business System will be launched in mid-April and is designed as a modular low-cost machine, able to support from two to 16 users. It is aimed at small and medium-sized companies and can

link with the company's existing point-of-sale terminals, bar code readers and any other remote computer, says the company's marketing director, Rene Frei.

The system is the result of a collaborative venture between Sweda and micro manufacturer CT. Frei says that the system has been designed to be "future proof" against new developments by making it modular, so that new or improved items of hardware may be implemented, including new processors, if required.

But the real strength of the

system, he adds, is the operating system, which the company developed itself. Called CTOS, it allows users to run Xenix, MS-DOS and CP/M-86 concurrently (it is actually capable of running 10 operating systems at once, Frei claims) and has the ability to incorporate others if required by users. A range of applications packages including word processing, Microsoft's Multi-Plan and electronic mail will be offered.

Networking using X-25, SNA or bi-synchronous architectures is provided together with the com-

pany's proprietary form of Ethernet, which is used for linking workstations in the system. The latter allows the SBS to communicate with other Ethernet supported systems, says Frei.

Hardware comprises a separate terminal and keyboard, processor and power regulation unit, currently based on the Intel 80186 microprocessor, and a range of floppy and hard disc options, with a maximum capacity of 80 Mbytes.

The keyboard has ports to allow a mouse, drawing pad or bar code reader to be connected.

## Message specialist arrives

by Donald Kennett

US MESSAGE communications specialist Sideral has launched a big push into the UK and Europe, with the aim of matching its current US turnover of \$28.4 million within four years from the UK alone.

In the shorter term, international marketing director, Bela Gyori, says that his target is to break even in the UK by the end of May. So far, however, the company has only received British Telecom's technical approval for one model of the six multi-function telecommunications terminals in its range.

Break-even point will be reached by selling 30 of them, Gyori says. To date the company has obtained US government export licences for 10.

The first model into the UK is the Microneer 8, which has a 6.8 Mbyte Winchester disc drive built in, can control up to eight communications ports of different types and sells in the US for \$18,000.

All models from the two-port \$2,500 Microneer 12 upwards run word processing software, as well as carrying out automatic speed and protocol conversion and auto-dialling on external lines.

The company has also negotiated with the Prestel Microneer 800 service providers to co-exist with the same product name, Gyori says.

To provide maintenance and support for the range, it has signed a third party maintenance contract with Plessey Controls.

The company started in 1971 in Portland, Oregon, by leasing lines and offering a message service. It then began to design its own products. But by 1980 its turnover was still only \$4.8 million.

It designed the first of its new range, the 68000-based Microneer 8, in 1981 and its 1982 turnover jumped to \$14.9 million and then \$20.3 million last year.

It now claims half of the Fortune top 500 companies as customers.

This group includes WUI, MCI, RCA Global, TRT Telecommunications and Western Union Telegraph. In fact, Gyori claims that 15% of all US international record traffic is handled by Microneer terminals. More than 20,000 communications lines are interfaced to Microneer terminals, he adds.

The company has set up offices in Hong Kong, Singapore, Malaysia and Greece, and expects to have one in Switzerland by the end of the month. It is also negotiating in other European countries.

## SALES BRIEF

### £650,000 for Applied Research

APPLIED RESEARCH of Cambridge won four orders in a single week worth a total of £650,000 for computer aided design systems. The orders came from Plessey Airports, the Greater Manchester City Council and two departments of London Transport. The systems enable drawings to be created and edited quickly and offer the ability to store standard features. The company turned over £3 million for year ending June 1983.

### Redwood supplies

UK SOFTWARE house Redwood is supplying its Uniplex suite of integrated Unix programs for business and office applications to micro-maker Wicat at a £100,000 deal. The programs, for word processing, spreadsheet and database applications, will be implemented on Wicat's 16-bit Motorola 68000-based micros.

### Prime oil deal

PRIME Computer UK has sold two of its minicomputers to Davy McKee, one of the largest UK firms of contract engineers supplying process equipment to the oil and chemical industries. The systems, a 9950 and 550, will run programs for applications including process plant design and project control.

### Scots on the ball

THE 111-year-old Scottish Football Association is automating its club and player registration with a computer supplied by Opticom. The system will handle 10,000 players and more than 300 clubs.

### GKN network

LEADING UK industrial group GKN is networking its major offices in London and the West Midlands with a Xionics Xinet system supplied by Master Systems of Camberley in a contract worth over £500,000. Three sites will be linked, and more than 80 workstations will be provided access to telex, Prestel and external databases.

### Farmers update

THE National Farmers Union is replacing a bureau service with an in-house ICL MB29 distributed mainframe computer for keeping tabs on its 130,000 members. The computer will keep information about members, and the union's information service will be extended by the ICL Bulletin system, which provides videotex facilities via Prestel-adapted television sets.

### Racal-Milgo sales

RACAL-MILGO has now sold three Planet local area networking systems to City of London financial institutions after signing a £158,000 contract last week with merchant bank Kleinworth Benson. The bank will use the system to switch between 220 terminals and 12 minicomputers for investment applications at its Fleet Street headquarters.

### ACT likes Apollo

APPLIED Computer Techniques has trebled its design equipment aided by Apollo Computer UK to £120,000. ACT has already used an Apollo Domain workstation in preparation for engineering design for the April portable 16-bit micro.

### CIS goes West

COMPTONVISION'S Cambridge Interactive Systems subsidiary has ordered £1.5 million worth of high resolution colour and monochrome graphics workstations from Texas Instruments Westward Micro Systems. It will sell them with its Medusa computer-aided design system throughout Europe.

# Steel town Corby gets extra boost

by Keith Holder

COMMODORE'S factory in steel shutdown town Corby, announced last year, will create 1,000 jobs and will have a capacity nearly six times the company's original estimate.

This will make it one of the largest microcomputer manufacturing facilities in Europe, if not the world, says Howard Stanworth, general manager of Commodore Business Machines in the UK.

Production is scheduled to start in September at 200,000 machines a month, although the maximum capacity could run as high as 350,000 machines a month, Stanworth claims.

The plant will cost £6 million, and the company will expand its investments to £20 million over the next two years.

The jobs, 600 this year, are expected to be filled from the local population, including graduates

from the area's technical college, says Stanworth. He suggests that the company may also provide assistance on electronics and computer study and training courses.

Many of the job vacancies will be open to young people. About 70% of the 200 staff employed at the company's pilot plant at Corby are under 25.

"The high quality of workers in the area and well developed industrial infrastructure all played their part in attracting us to the area," Stanworth explains.

Corby has suffered a high rate of unemployment following the decline of the town's iron and steel industry, which made it the second worst area in the country three years ago.

Since that time, says Kelvin Glendenning, chairman of the Corby Industrial Development Committee, new industries have helped reduce unemployment to 19%, or 44th in the ratings.

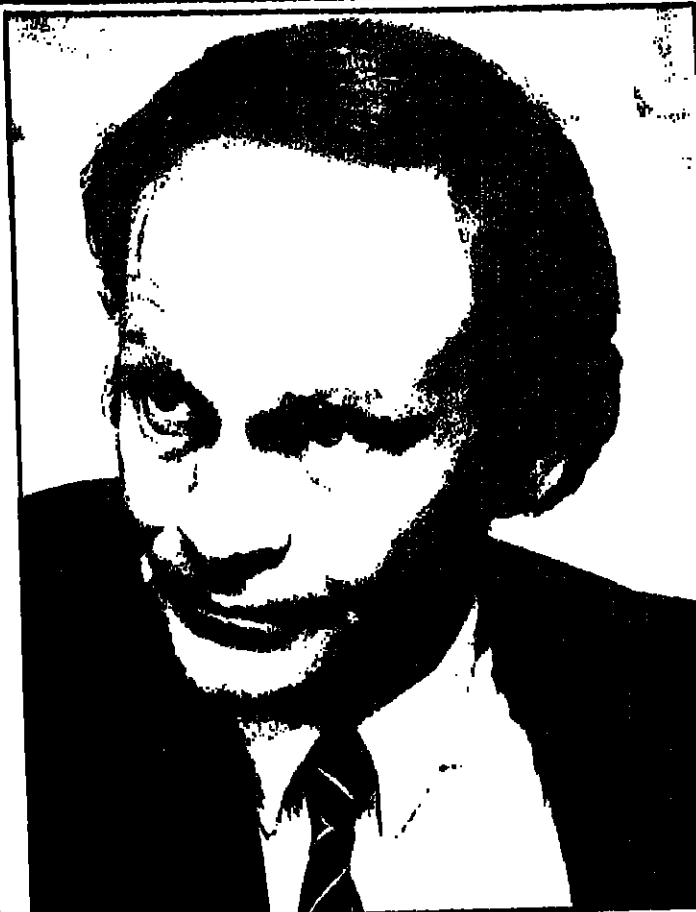
"The presence of Commodore will have the effect of attracting other industries into the area," Glendenning believes.

Stanworth says the decision to set up a manufacturing plant in Britain was a result of the high demand for the company's products, which he hopes will grow. But he criticises the BBC's decision to bar any non-British manufacturer from tendering for the lucrative BBC computer contract.

"Our commitment to this country is greater than any other micro manufacturer," he states.

The new factory will take over production of the Vic 20 and Commodore 64 from the company's West German plant in Braunschweig.

Commodore claim sales in the UK reached 800,000, with a sharp upturn in demand this year. Stanworth estimates sales of the company's micros will top £120 million this year.



STANWORTH... "Many vacancies will be open to young people."

## AT&T markets minis

■ From front page

the 3B20D, a "failsafe" computer which AT&T says sets "new standards of uptime". In effect the machine is already in use within AT&T telephone networks, and the company emphasises that although it is offering computers for the first time, some of the products are well proven as part of other systems.

The 3B20S, and an upgrade version, the 3B20A, are both heavy duty minicomputers for general and office applications. The 3B20S is described as a "mid range mini computer"; the model 100 will handle up to 30 users, the 200 up to 60.

Finally, the 3B2 is a desktop 32-bit multi-user workstation, with up to 18 users, and 256K main memory. The networking product is an Ethernet based local area network.

Prices range from \$340,000 for the 3B20D, through \$230,000 for the 3B20S, to \$9,950 for the 3B2 workstation.

## French group gets into compatibles

by Jack Gee

FRANCE's state-owned Thomson group has entered the IBM Personal Computer compatible market, following an agreement under which it will begin distribution and later manufacture - of US manufacturer Eagle's range.

Thomson now clearly regards itself as an alternative to IBM in France, and aims to achieve a turnover of FF225 million (£20 million) in micros this year.

Sales of the Eagle by Thomson depend heavily on the performance of the dollar, the erratic movements of which on the foreign currency market make it extremely difficult to estimate the cost to potential users.

A decision on manufacturing will be taken later in the year. The plant used will be in Brest, where Thomson is already building Fortnum's Micromega 32. It has been importing the Micromega for several years.

Thomson says it has chosen the Eagle micros for its entry into this market slot because they are among the few units that offer total compatibility with IBM's PC.

In the first stage Thomson will sell only the desktop Eagle. The French company considers that its domestic market is not yet ready for the portable version.

Although the Eagle and Micromega machines are incompatible, Thomson points out that they can operate together with file changes.

Another important move on the Personal Computer front in France is believed to be close, following persistent reports that Matra, a leading French electronics firm, is about to take over the French subsidiary of Norsk Data and market its 32-bit computer.

This move would fit into a new Matra policy of marketing workstations. More significant, an agreement between Matra and Norsk Data would mean that the French government would allow Matra to join Bull, which so far has been granted a monopoly in selling scientific computers.

Bull is currently negotiating with Gould, Harris and Ridge Computer to introduce a 32-bit machine into its own range.

Bull has recently signed an agreement with Renault, which is certain to cause considerable irritation at IBM.

The agreement sets out an extensive framework for co-operation between the French vehicle and computer manufacturers. A Renault official says: "Until now we have been very much an IBM customer."

## ICL joins robot firm

by John Riley

ICL has joined hands with Crawley-based Redifusion Robot Systems to work on an eight-month plan to create an integrated factory automation system.

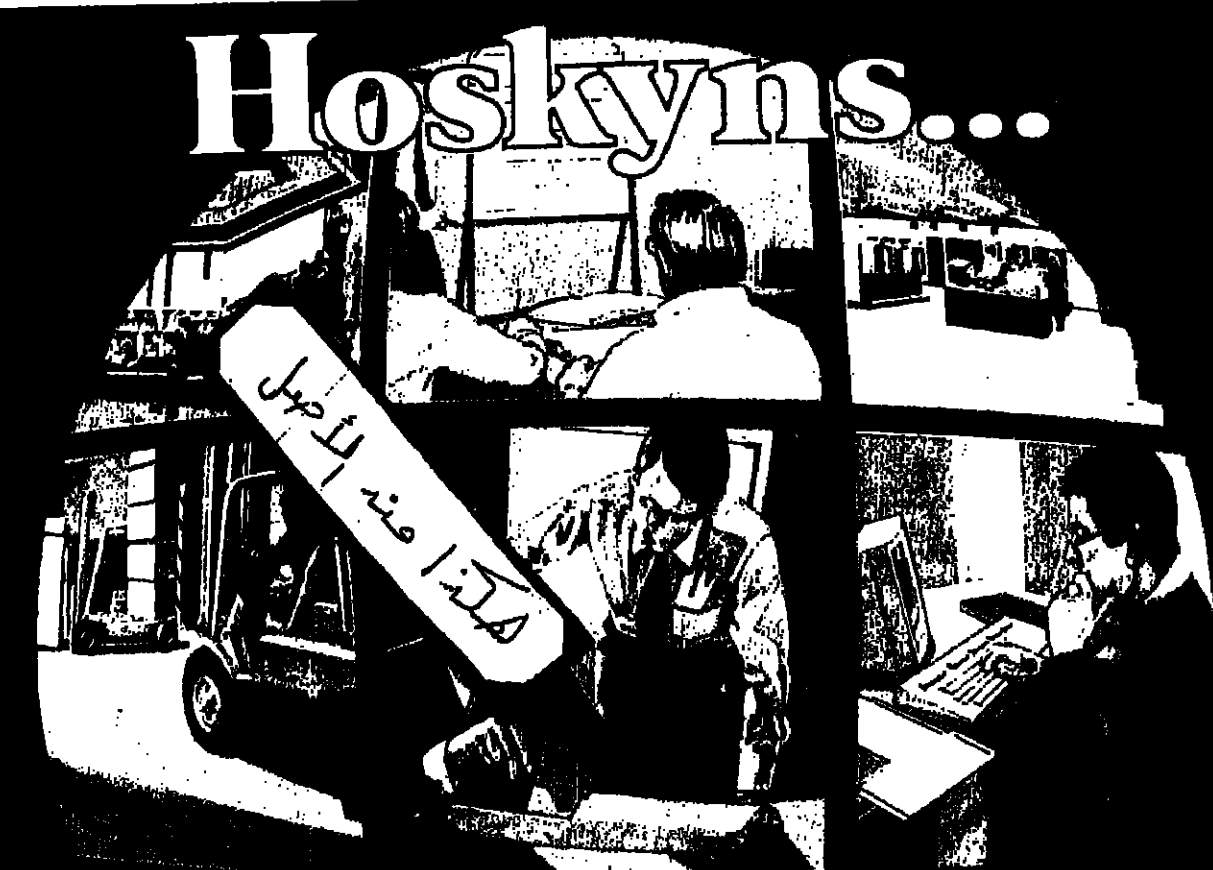
The £250,000 project, 33% of which is funded by the Department of Trade and Industry, will concentrate on the area of real time scheduling and monitoring. That area is the link between ICL's production and control systems, such as Genac and Safes, and Redifusion Robot's work cell controllers for automated equipment, including robots.

"Our aim is to create an all British presence in this area," says Keir Hopkins, director of ICL's applications systems division. "When tendering come up for factories of the future, we intend to be ready for them."

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HOPKINS... "Ready."

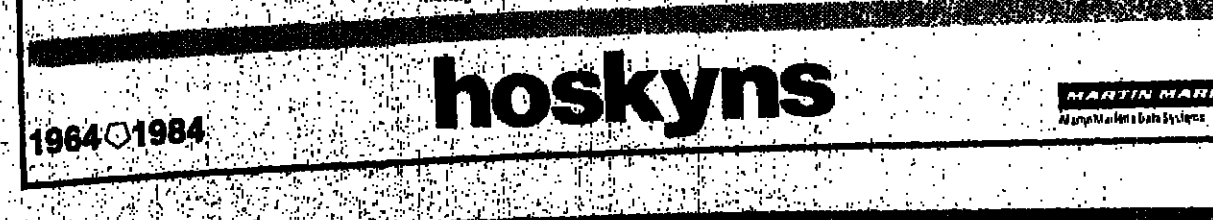


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**Apple slices the market**

by Keith Holder

APPLE Computer is changing policy towards its dealer network by demanding that they put their house in order and decide which market segment each is going to serve.

Allied to this will be a closer relationship with the dealer base to provide better coverage of its growing product range, says Apple's UK managing director, Peter Cobb.

"Apple too is changing," he adds. "A year ago we were a two-product company; now we have to think about how our newer products fit in to the market and which environment they need to be sold in."

He strongly criticises recent reports that the relationship between Apple and its dealers has soured, saying: "We rely on our dealers exclusively to sell our products and have always enjoyed good relations with them. That is not going to change."

Cobb also denies that recent departures by the UK management team represent either a shake-up or radical change in direction by the company.

"We are changing now that we have a broader range from a company that makes boxes to a company that provides solutions to user needs - hardly the sort of change that causes people to leave," he comments.

He adds that the dealers will have to change too, becoming allied with the needs of their markets.

As an example, he compares the situation with buying a car. "The average buyer does not go to a car dealer expecting to have every item of the technical specification rammed down his throat."

"Similarly, the computer user is more interested now in getting the right machine to do the job he wants - he doesn't want a blow by blow account of every circuit in the box."

Cobb also says that dealers will have to match their premises to the market they are trying to serve, pointing out that a business user will not venture into a "corner shop stuffed with teenagers playing computer games".

Post-sales support is another issue which Cobb says has got to be right, and some dealers are still not providing a complete service, he says.

Cobb emphasises that Apple will be looking at these areas more closely now, and greater liaison with dealers will help give the user a better deal.

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**ICL joins robot firm**

by John Riley

ICL has joined hands with Crawley-based Redifusion Robot Systems to work on an eight-month plan to create an integrated factory automation system.

The £250,000 project, 33% of which is funded by the Department of Trade and Industry, will concentrate on the area of real time scheduling and monitoring. That area is the link between ICL's production and control systems, such as Genac and Safes, and Redifusion Robot's work cell controllers for automated equipment, including robots.

"Our aim is to create an all British presence in this area," says Keir Hopkins, director of ICL's applications systems division. "When tendering come up for factories of the future, we intend to be ready for them."

Redifusion Robot Systems was founded in October 1982 as a spin-off from Redifusion Simulation, owned by British Electric Traction Company (BET), which also owns Redifusion Computers.



## Small Ada house's sales leap

by Philip Hunter  
SMALL Ada development specialist house High Integrity Systems has sold £500,000 worth of products and consultancy in the last six months.

The company, based in Hertfordshire, has European marketing rights for an Ada compiler developed by US chip maker Intel. High Integrity's hardware products are based on Intel iAPX 432 chips, packaged either as boards or as boxes with development software in the Multibox workstation.

The company also offers training and consultancy, which so far it has sold to six UK companies.

At present the compiler has to be hosted on a Digital Equipment Vax minicomputer. Programs are compiled on the Vax, and the machine code produced can be downloaded on to the Multibox for execution and run-time debugging.

According to High Integrity's managing director, Daphne Gordon, the Multibox is used either as a development machine by programmers experimenting with Ada programs compiled on the Vax, or, with different software, to drive real time applications, such as process control or simulation, with



GORDON... Marketing effort is hampered by secrecy clauses.

finished Ada programs.

"About two-thirds of our customers use it for development work, and one-third are past the development stage into the applications arena," she says.

Gordon expects to have sold 50 Multibox machines by the end of the year. Meanwhile her marketing effort is hampered by secrecy clauses in contracts which prevent the applications being

discussed in the open.

"Most of our customers are very secretive. A lot of our systems are in government departments and military applications throughout Europe," she says.

The Intel Ada compiler is due to be validated by the American National Standards Institute later this year. So far two other US companies, Rolm and Western Digital, sell fully validated Ada compilers.

## SERC puts in claim for extra £8m

by John Riley

THE Science and Engineering Research Council (SERC) wants an extra £28 million from the government over the next five years to boost research in applications of information technology to manufacturing systems.

That area is one of several that will suffer unless the Department of Education and Science raises the grant to the combined Research Councils by £98 million over the next three years to a total of £1,812 million, according to the SERC.

The council wants to set up a new directorate to enlarge the scope of three programmes: robotics, the application of numerical control to manufacture, and research into the efficiency of production systems. That directorate would get £4 million in 1984/85 and the sum would rise by £1 million each year to £6 million in 1986/87 if approved.

A spokesman from the Department of Education and Science says that Education and Science Secretary Sir Keith Joseph will answer in April.

The SERC currently spends £12 million a year on information technology research, which is expected to rise to £25 million each year by 1986. Support includes research into microelectronic devices, control engineering, computer architecture, man-machine interfaces and software technology.

The National Environment Research Council conducts some research in information technology, particularly in the areas of spatial database research and the design of geographic information systems. The Social Sciences Research Council hopes to set up a research programme on information technology in education and also to encourage projects on the "man" side of man-machine interfaces, taking in linguistics and psychology.

## Indian order for Open University

THE UK's Open University is set for a big order from India for its computer awareness package for teachers following the Indian government's choice of Acorn as standard supplier to its schools. Dr Tim O'Shea, director of the university's Micros in Schools project, was in India last week, having already been visited here by the Indian education ministry. Acorn is supplying around 200,000 machines.

## TV licence case

A HOME computer user charged with having no television licence had his case dismissed last week. Peter Battle told magistrates at Ilkeston, Derbyshire, that he used the television purely as a display for his computer.

It was pointed out that having no licence was only an offence if the set was used as a receiver.

## Working Pegasus

THE last of the working Pegasus computers, manufactured by Ferranti between 1956 and 1962, is to go on display in working condition at ICL's West Gorton site, where it was originally made, in a deal with the Science Museum. The museum did not have enough space for it. The new Computer Museum in Boston, US, had room but would not keep it working.

## Sperry backs golf

SPERRY is following IBM into golf sponsorship by backing a European order of merit to the tune of £100,000. It will be shared by the top 10 players after the European tour, which will take in 28 tournaments between April and November.

## ICL lands 1,000

ICL has now installed 1,000 System 25 business minicomputers in the UK, after delivering 11 to the North West Water Authority. Another 500 are on order in the UK, while worldwide 3,500 are on order or have been delivered since the machine's launch in July 1981. The company has so far earned £30 million from System 25 sales in the UK.

## GEC drops cable

GEC has dropped its plans for joint venture in cable television equipment with the Jerrold subsidiary of the US company, General Instruments, and is to go it alone.

The joint venture was agreed in principle last year, and an office was set up in Slough with 72 development engineers and sales people, 59 of whom came from GEC and 13 from Jerrold.

A GEC spokesman says that GEC has terminated negotiations and has decided to go ahead on its own.

## Bleasdale system

BLEASDALE Computer Systems points out that, although the intelligent knowledge based workstation to be developed for the Alvey project by the company with GEC, ICL and Ferranti will be "conceptually the same" as Bleasdale's existing system, it will not be "based" on it, as we reported last week. The Alvey workstation will be a 32-bit machine, and will use a different database.

## Reuters goes back

THE strike of 300 computer programmers and technical staff at international news agency Reuters ended last Friday. The National Graphical Association 1982 withdrew its claim for an across the board 5% cash extra for handling new equipment, after management had agreed to backdate an original offer of responsibility money from July to April 1983. All the staff are now back at work.

## Electronic mail takes another step

by Donald Kennett  
A NEW company has been formed with the aim of taking electronic mail to the mass market.

The company, London-based Kensington Datacom, launched its service earlier this month after nine months' preparation and with the backing of £1 million in venture capital. The service, called One-to-One, is designed to be used by small businesses with almost any kind of microcomputer, terminal or electronic typewriter.

It uses the telephone and telex networks and the postal service to deliver messages, singly or in batches.

The first two distributors to market the service, the UK subsidiary of US microcomputer software wholesaler, Softsell, and Memec's subsidiary, Technology Warehouse, give the company po-

tential access to more than 1,000 dealer outlets.

Managing director, Harvey Coleman, says: "If we say you can send electronic mail for the price of a second class stamp, that means overnight. The dealers get commission on traffic generated to encourage them to devise new applications."

The service can also be accessed via standard terminals and modems. Users pay a £50 annual subscription plus usage charges for the various services, the first four of which are send and receive telex; instant mail delivery to another user's electronic mailbox; "One-to-One letter" delivery by post; and multiple-address deliveries via any or all of the first three methods.

Other services, such as database access, facsimile conversion and teletex, are planned.

Dealers sell a £150 software

package designed to make it easy to use the service and a £280 modem with a message waiting lamp, which the service activates overnight. The dealers get commission on traffic generated to encourage them to devise new applications.

The service can also be accessed via standard terminals and modems.

Users pay a £50 annual subscription plus usage charges for the various services, the first four of which are send and receive telex; instant mail delivery to another user's electronic mailbox; "One-to-One letter" delivery by post; and multiple-address deliveries via any or all of the first three methods.

Other services, such as database access, facsimile conversion and teletex, are planned.



COLEMAN... "We want people in droves."

## Device makes speech conversion cheaper

by John Kavanagh

A SMALL UK firm claims to have produced the world's first low-cost device for converting computer output into speech with correct pronunciation.

Currah Computer Components plans to launch the device in the home and educational computing markets in the summer. It is looking for a new financial partner to back growth which could increase its turnover by over 1,000% this year.

Last week the company won a £25,000 national electronics prize for the device in a competition sponsored by Hartlepool Enterprise Agency and trade newspaper Electronics Weekly.

Production is set to start soon at GEC's new Electronics and Mechanical Assemblies and Components Division in Hartlepool. Some 30 jobs are expected to be created in GEC and Currah, which is also based in Hartlepool.

Currah is tight-lipped about its product, saying only that it uses very large scale integration to cut the size and cost of the device and that complex algorithms and rules have been developed to translate text into the sounds that make up speech.

The design allows new sets of rules to be added, opening up the prospect of selling the device with other languages.

"We're using GEC because it has very high quality control, it's giving us a tremendous amount of support and it's local," says chairman Anthony Sillars. "We're not talking about a product with £10,000-type quality, but I think it's going to be absolutely super."

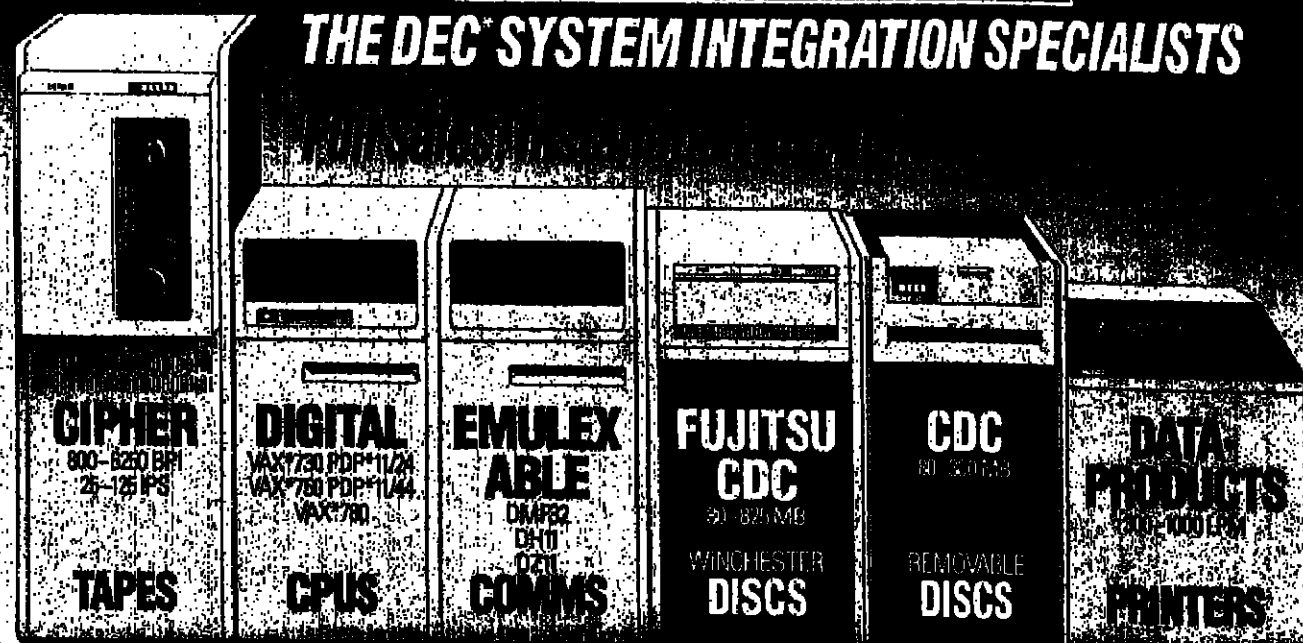
Currah is launching four products this year and needs extra financial backing for working capital rather than research.

The company was formed three years ago and has 12 staff. Its products include black-and-white displays and a speech synthesis device for Sinclair Spectrum microcomputers, the Microspeech, which sells for £30. All manufacturing is contracted out.

In its financial year ending June 30 1983 its turnover was £69,000. But booming sales of Microspeech in particular are expected to bring a turnover of £200,000 this year.

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T. Bolter

Terry Bolter, General Manager  
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# Cincom Systems



## Centre-file goes for retailers

by Donald Kennett  
CENTRE-FILE, the computing services subsidiary of NatWest Bank, has launched a batch processing inventory management service designed for high street retailers with five or more branches.

The first customer for the service, called RIMS, is Blacks Camping and Leisure, which has 25 branches, but plans to grow to 200 soon. Blacks' first two branches will start using it from the end of May.

Centre-file's controller of general accounting services, John Guilbert, says: "Point-of-sale systems are getting cheaper and more reliable, so the market is ready for substantial growth in computer services. We are committed and ready, and we expect to take a substantial share of that market."

The company expects to add 2,000 to 3,000 new users to its books by the end of 1984 through RIMS, compared with 2,500 users for its current most popular service, payroll.

RIMS is similar to an online ser-

vice the company has been providing to large retailers for the last year, starting with Harvey Nichols, which helped develop it. But RIMS is designed to collect transaction details from scattered point-of-sale terminals through the telephone network overnight and to deliver the printed reports via Securicor for collection from the nearest branch of NatWest Bank.

The company has put £500,000 into developing it over the last year. Using it will cost from £20 a week per branch, depending on the optional facilities used.

"I don't think you can employ a clerk for that kind of money," says Guilbert.

Retailing was the worst hit sector of commerce last year, suffering almost a quarter of the 12,466 liquidations registered in the UK, according to the company.

This makes the sector a prime target for services such as RIMS, the company believes, which is designed to help retailers improve profits by optimising their stockholdings and improving stock turnover.



FAIRBAIRN... "User friendly software is main barrier."

## Micros win over less economical typewriters

by Nuala Moran

THE cost of handling text information on micro systems is now lower than doing it by conventional means. David Fairbairn, director of the National Computing Centre, made the statement, and he forecasts that by the end of the decade electronic handling will cost only one-fifth of using typewriters and files.

"The main barrier to this is user friendly software," he says.

Fairbairn was speaking at the launch of a low-cost personnel system developed with backing from the NCC. IMP, Integrated Modular Personnel System, was developed by Percom, a British software house set up in 1982 to specialise in producing software for personnel management.

IMP runs on the Sirius and the IBM-PC, and Percom has also been commissioned by Future Technology Systems to develop a networked system based on its PC-86. This will be available in June, and Future already has one order for the system from the Leicestershire police. This project is being funded by the Department of Trade and Industry's office automation scheme.

Percom has already attracted £475,000 to develop its system. This included a £234,000 grant from the DoT's software products scheme and £100,000 from the

British Technology Group. The software products scheme is managed by the NCC and money granted through it supports marketing for the first two years of a product's life, as well as its development.

IMP consists of a basic personnel records module which handles the 80% of the business which Percom found was common to every personnel department. The company plans to release additional modules over the next 12 months in specialist areas such as recruitment and selection, training and career development, sick pay and job evaluation.

The basic module costs £4,950 and additional modules about £250 each. Leasing facilities are available on both the hardware and software and Percom says it is one of the first companies to offer leasing on a total system.

Included in the basic price is a feasibility study by an independent consultant on using the system, including security and what manual records to keep, for example in discipline and grievance cases.

Percom marketing director John Angel estimates that it will cost upwards of £10,000 to install an IMP system. He compares this to software alone on mainframes costing £30,000 and mini systems costing £40,000 upwards.

## Hogan attacks Europe from new Woking base

by George Black

HOGAN SYSTEMS, the Dallas banking software house, sets up its European base in Woking next week, and plans to use it as a launch-pad into Switzerland, France and Germany.

The Woking office, which will house about 25 staff, opens just a year after Hogan arrived on this side of the Atlantic and took up temporary premises in central London.

Hogan specialises in IBM-mainframe-based systems for large banks.

It has about 125 installations worldwide to date and plans to open a small sales office in the City, to be followed up by a Swiss office before the end of the year.

Frankfurt and Paris offices are expected to open during 1985. So far, Hogan has picked up one big

British customer, but has not disclosed its name.

A recent London seminar held by Hogan attracted some 90 delegates from the banking fraternity, and European marketing director Alan Whitford predicts a big saving to packaged software.

"Financiers realise that their systems are out-of-date. Regulations have changed, competition is fiercer and their software is old, generally batch-oriented and inflexible. They have to look at re-writing it."

"To re-write it themselves could cost them \$5 million and take three years or more. That's why they are moving to packages."

Hogan's annual results, due out next month, should show whether the company is getting its message across.

## Plessey and CAP win Navy order

by Philip Hunter

PLESSEY Displays and CAP Scientific have jointly won the first big UK defence computer systems contract under new procurement rules designed to encourage UK high technology exports by allowing use of standard hardware and software.

The two companies are to supply the Royal Navy with Nautis, a navigation and action control system, for its new generation of small mine-hunting ships. The contract is worth £2.5 million initially.

The Ministry of Defence's new Cardinal Point Specification procurement rules, introduced during the last two years, give contractors a list of written requirements, rather than the more stringent and detailed technical drawings issued previously.

Under the old procurement rules, contractors were effectively tied down to a specific application, with little prospect of applying the technology developed for other applications.

Nautis is built around distributed processors based on Intel chips, and system software developed by Plessey, which can be applied to other defence applications.

Even the application software developed by CAP contains parts which are being used for other contracts. Some of it will figure in a similar system which Gresham CAP, a sister company of CAP

Scientific, is developing for Navy submarines in a multi-million pound contract to be announced soon.

The advantage of the new procurement rules for the Ministry of Defence is that systems can be developed more cheaply because the technology can easily be adapted. The danger is that systems like Nautis will be installed by hostile navies.

Nautis consists of consoles with high resolution displays and purpose-built keyboards linked by an international standard bus architecture. Plessey says that the standard nature of both the bus and the Intel-based processors will help win export orders.

Nautis works by matching data from radar and sonar soundings with information held on a standard commercial-type database, and then calculating the position of the ship far more accurately than is possible with conventional navigation.

The system also indicates the position of suspected mines, and can initiate appropriate action.

Nautis is initially going to be installed in two mine-hunters, but the Navy eventually plans to build over 20 more, and the contract's value could reach £30 million.

Plessey Radar last year won the first big contract of any kind awarded under the new procurement rules to supply the Royal Navy with radar equipment worth almost £30 million.

## Libraries show Prestel

by Donald Kennett

CANADIAN computer manufacturer Gec has built a system to support public access to Prestel libraries. The first user will be the London Borough of Bexley.

The system uses Gec's 80-column monochrome VDU, which can access the library's own database as well as outside systems via the library's central processor. When connected to Prestel, the VDU shows guidance notes and a running total of the user's bill on the right half of the screen, whilst the 40 columns of the Prestel page appear on the left.

When the call is completed, the user's bill is printed automatically at the librarian's desk.

Gec's networking products manager, John Burton, says his company is the leading library automation supplier in North America and Europe. It specialises in building dual-processor mini-based systems to support networks of up to 1,500 terminals and databases occupying up to 10 300 Mbyte disc drives.

Newdata facilities are also available on the Displayphone voice and data terminal made by Gec's fellow Canadian manufacturer, Northern Telecom, which Gec put on show for the first time in the form approved by British

Telecom at the Online Business

Telecom exhibition last week. Gec markets the Displayphone, which has been in production in Canada for three years but which has been held up in the UK by the BT approval process.

The device was put in for technical approval before responsibility for this passed from BT to the British Approvals Board for Telecommunications.

It is also the first of a generation of devices which provide voice and data facilities over two telephone lines at once.

It was followed by a terminal from yet another Canadian company, the Miel Kontakt. This terminal is a more comprehensive device which includes a built-in disc drive and interfaces to telex and the telex network as well as to Prestel.

BT required the Displayphone to be modified to include separate recall buttons on versions to be used with PABXs, together with lamps to show which line was in use, instead of using one of the soft keys with an indicator on the screen to show what its function was.

Approval was granted last summer and the device is now going into volume production for the UK. Gec has sold 40 so far.

## Rank teams up with French

RANK XEROX, the multinational office automation company, is to explore the French market for commercial applications in artificial intelligence.

It is getting involved in a joint development agreement with Teclat, a French state-owned subsidiary of French state-owned Compagnie Générale d'Electricité.

Under the agreement, Teclat will develop and market artificial intelligence applications based on the Xerox 1108 workstation.

The systems will be developed with Lisp Interlisp D, Xerox's own package designed specifically for applications of artificial intelligence. This development software will be supported from the UK by Artificial Intelligence, a company which was separated from Rank Xerox, a worldwide move into the artificial intelligence market.

Xerox says it is talking to several German companies about possible collaboration there, with another Compagnie Générale d'Electricité subsidiary, Demet, one of the favourites to take the business.

## ICL sells turnkeys to world's police

by John Riley

ICL last week announced that it has signed a Turnkeypoint agreement with systems house Data Logic to sell turnkey systems to police forces in the UK and in former British colonies.

ICL also formally announced a £3.5 million deal with the Queensland police in Australia, multiple orders to UK magistrates courts totalling £800,000, and the supply of systems to the North Yorkshire and Lancashire police forces.

According to Data Logic's managing director, Alan Thomas, one of the "most important" factors influencing his link-up with ICL is ICL's Content Addressable File Store (CAFS). CAFS, a hardware device based on about one dozen Intel 8086 chips, enables records to be taken from a database rapidly and economically, without placing heavy demands on the central processor.

Under the deal, Data Logic will sell turnkey police systems based on ICL's 2900 mainframes. Data Logic already has experience in the police sector. It has installed a criminal information system into South Yorkshire in 1979, and a

Data General-based system into the West Mercia Police force in 1982.

"This is a three-year marketing programme and we will co-operate with a sales campaign, pool our experience and interchange our skills," says Thomas. Data Logic is a subsidiary of the US company Raytheon.

David Small, ICL's director of product marketing, says that 35% of ICL's business is in the public administration sector: "We are strong in local government," he says, and "now we are bringing the law side up to the same level."

The Queensland Police Department is to get a dual 2958 mainframe with CAFS, 5,000 Mbytes of disc, and 220 terminals at its Brisbane headquarters this month.

ICL announced recent orders from Buckinghamshire, Dorset and Wolverhampton magistrates courts respectively to install ICL's specially designed system for using ME29 machines. ICL says that out of the 600 magistrates courts in the UK, only about 120 have computer facilities of any description, and ICL's system is installed in about 50 of them.



SMALL... "We are bringing our law business up."

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# NatSemi strides ahead in the 32-bit chip race

by Keith Holder  
US SEMICONDUCTOR manufacturer National Semiconductor (NatSemi), has extended its lead on its rivals in the 32-bit chip race with the adoption of its 32032 product by an OEM and a leading systems house.

The OEM, London-based Whitechapel Computers, and Logica, have taken the device for work on a new version of the Unix operating system and a new personal workstation respectively.

Logica is developing a new virtual memory version of Unix, based on Microsoft Xenix 3.0, which will run on both NatSemi's 16032 and 32032 processors and provide the basis for a "universal" Unix system planned by NatSemi.

The latter is aimed at providing users of Xenix, NatSemi's own Unix and Unix System V with a compatible operating system to preserve users' investment in exist-

ing versions. The advantage of such a system, says Stuart Hooper, Logica's software products group manager, is that it will combine NatSemi's background in computer aided design and scientific applications with Logica's commercial Xenix base.

He estimates that Xenix accounts for around 60% of the installed user base.

Logica is also involved in developing a version of Xenix for Acorn Computer and another, unnamed, European supplier.

Whitechapel, which comprises a number of ex-Logica staff, plans to launch a personal workstation based on the NatSemi NS 16000 family.

Director Timothy Eccles says that the system, which will be based on a single board design, will offer more power and high resolution graphics capability.

He says the company chose the NatSemi product because "the 16000 architecture is technically superior to any other microprocessor commercially available today".

Eccles adds that the combination of a Unix based system, incorporating virtual memory support, will give users in design and software engineering the flexibility needed at a price under anything yet available. The workstation is planned for launch this summer.

For NatSemi, this marks another step ahead of its competitors in the 32-bit field.

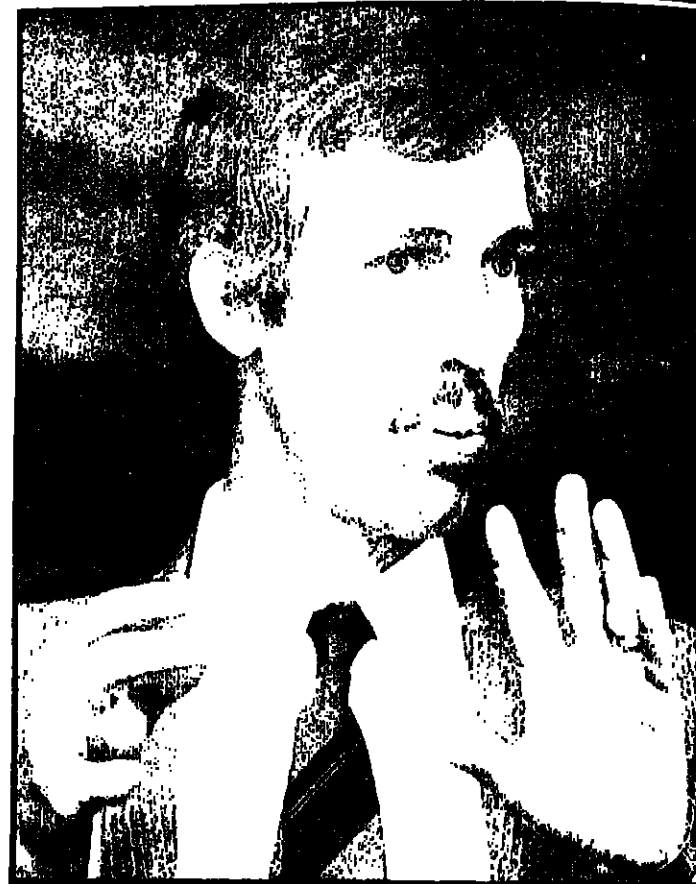
Its main rivals Zilog, Motorola and Intel, have yet to sample their 32-bit devices, and Intel recently put back the date for this until 1985.

Zilog, which has just signed a second source agreement with NEC, does not expect to sample its 32-bit Z80000 chip until February.

Though this is more powerful than the NatSemi device, by a factor of five to one, Jean-Claude Mathon, NatSemi's European product marketing manager for the NS16000 family, says that by the time the Zilog chip is on the market the company will have sampled its CMOS 32132 processor, which will be up to twice the power of the Z80000.

He thinks the company's strong position in the 32-bit market "is the product of far sighted planning, especially in CMOS technology". NatSemi also claims that is the only chip manufacturer to offer complete compatibility for its eight, 16 and 32-bit products.

Mathon concludes that the company's lead in the 32-bit field could have come even earlier. "We were ready to make the 32032 about the same time we were launching the 16032, but decided the market was not developed enough."



MATHON... Lead could have come earlier.

## Technology gives fresh hope

by John Kavanagh  
INFORMATION technology minister Kenneth Baker had a special invitation to tea last week - from a disabled woman who says technology has allowed her to "return to the land of the living and leave the land of cabbages behind".

Sylvia Cox has been crippled with pain since a car accident in 1973 and confined to a wheelchair since 1980. She had to give up her job in 1978 when travelling to work became too difficult.

But in the autumn of 1982 Baker introduced a scheme under which the government would pay for equipment to allow disabled people to work from home.

Baker's scheme put a new firm, Exis, which launched a computer-based service providing details of hazardous materials to shipping companies, in touch with Cox and she is now a permanent full-time employee.

She works from home, entering data on a Commodore microcomputer paid for by the Department of Trade and Industry under its Remote Work Unit Programme.

Cox wrote to thank Baker for



COX... Returned to the land of living.

the scheme. "My life has changed completely," she wrote. "I can now do battle with pain far more easily than of late."

She added: "It's not possible for me to express my true feelings about all this."

An international conference and exhibition on using computers and electronics to help disabled people is being held at Sheffield City Polytechnic from April 17-19. Telephone 0742-665274, extension 3360, for details.

## French develop word package for the blind

by Jack Gee  
A BLIND French typist has developed a word processing program package for the sightless based on voice synthesis technology and using a French language version of Wordstar, the Ministry of Industry and Technology announced in Paris.

Typist Jean-Marie Bonnet, a Ministry employee, spent a year working on the project alone before his superiors gave the go-ahead for state financing to be made available to develop his idea.

An Axel A20 microcomputer equipped with a voice synthesiser was used by the technical team composed of Perma (a subsidiary of French computer manufacturer Internequip) and Micropo, the designer of the Wordstar package.

The French team says that its program, created for the blind but appropriate for all users, can run on CBM and MS/DOS on most makes of microcomputer.

The use of Braille, the touch sensitive "language" used by the blind, is limited to identifying the program on the floppy disc which is marked in Braille.

"A blind operator simply selects his floppy disc, puts it into the computer and speaks to the machine to ask if it is ready," said an Internequip executive.

Then the computer replies: "Ready. Start of program," and the program runs according to vocal instructions which are repro-

duced on the screen (for the use of operators with normal sight).

The French team has added another advantage to the normal Wordstar program. This enables the blind operator to obtain a vocal report on the state of a file or a position during the course of the program.

The French Axel 20 is a 16-bit microcomputer built around an Intel 8088 microprocessor and its family of components. Its keyboard is that of a standard modern typewriter (to which many blind people are well accustomed). Its screen provides 24 lines of 80 characters.

Internequip says that the program for the blind has already aroused enormous interest abroad and will soon be adapted to foreign languages.

Internequip's Perma subsidiary has handed over its French rights to the Ministry of Industry and Technology, but will sell them itself to its first overseas customers in the French-speaking part of Canada.

It is estimated that a market for 9,000 voice synthesis copies of Wordstar awaits the program which sales begin in Canada in the spring.

The designers say that besides the blind users' application, the system is particularly suitable for teaching typing, consulting files on floppy discs and general instruction in reading and spelling.

## IBM gets another rival

by Philip Hunter  
DIGITAL Microsystems, UK micro maker and local area network specialist, will this week announce its move into IBM compatible market, with a 16-bit networking product that runs the MS-DOS operating system.

The new product, the DMS816, will be made at the company's factory in Wokingham, where the present eight-bit CP/M machines are built.

Meanwhile, one of the company's dealers, Surrey-based Systems and Software has launched an aggressive marketing campaign aimed at the 200 remaining users of the ageing Sperry BC7 minicomputer.

So far the company has persuaded 10 BC7 users to switch to DMS's HINet local area network, including Ken Barrington Sportswear, one of the UK's major importers of sports clothing and accessories.

According to John Hawkins, director of Systems and Software,

the DMS HINet is the only real replacement for the BC7.

"Sperry itself has brought out nothing to replace the BC7," says Hawkins.

BC7 users have two choices if they want to carry on with Sperry. One is to move on to the System 80, which will run BC7 files without any need for conversion, and will also run Sperry's Mapper application generator software.

The other option is to move to the dedicated Mapper range, the Mapper 5. But System 80 prices start at £50,000, and Mapper 5 prices begin at £30,000.

A complete hardware and software solution, based on DMS's HINet, with three remote and 20 Mbyte disc storage, will do the job for just £20,000, Hawkins maintains.

The software house is co-operating in marketing its product to convert BC7 files to run on HINet with DMS distributor Selven Systems, which supplies software for DMS hardware.

## More head for gateway

by Philip Hunter  
PRESTEL's gateway, which gives subscribers access to private videodata systems, looks set for a dramatic increase in use this year.

British Telecom, which set up the Prestel videodata service in 1982, says that gateway will be linked to 50 private databases by the end of the year, compared with 14 at present.

Most of the existing 14 gateway information providers are in the travel trade, which is the most mature market for videodata services.

Nearly 5,000 UK travel agents subscribe to the main Prestel service, and gateway provides them with access to the private videodata systems of airlines and tour operators so that bookings can be made within seconds for the cost of a local telephone call.

One single gateway service, Skytrack, for example, enables travel agents to book flights with any of 10 US airlines.

The gateway has been slow to make a wider impact since its announcement - early in 1982 - because firms in other vertical markets apart from travel have not been ready to make private videodata available.

But now Prestel predicts a boom in use of gateway applications in insurance, agriculture and telephoning. Friends Provident recently linked its private videodata system up to gateway to enable insurance brokers to obtain quick quotations on life assurance premiums through Prestel.

This move is likely to have a knock-on effect among other life assurance companies, which will want to make it just as easy for insurance brokers to obtain quotations for their policies.

Connection between private databases and Prestel via gateway has until now always been over a permanent leased line.

But British Telecom has decided to change to switched virtual circuit operation, which means that in future connections will have to be made by dialling the number of the computer holding the private information.

BT says that users will notice no difference, since the connections will be made in milliseconds.

The first switched virtual circuit gateway system in the UK was installed earlier this month by Freight Computer Services. In this case the gateway access is handled by software designed by London-based Aregon International, the UK leader in the market for gateway and videodata products.

## MICRO NEWS

# Zilog signs NEC as 32-bit source

by Keith Holder  
CALIFORNIAN chip manufacturer Zilog has signed Japanese Nippon Electric (NEC) as the first alternate source for its Z80000 32-bit microprocessor. And it has set February 14 next year as the official date for this and the long-awaited Z800 16-bit to join its Z80 and Z8000 processor lines.

The second-source agreement with NEC for the Z80000 is the first of a series of deals to be signed with other manufacturers, says a Zilog spokesman. The aim is to establish a strong base of alternate sources for the product.

He describes the Z80000 as "a revolutionary part with a billion dollar future".

Under the agreement, NEC will receive mask sets and data to test

and manufacture the chip, but not on-site engineering assistance, says David Guzman, Zilog vice-president for marketing and strategic planning.

"Some of our competitors are further ahead with their 32-bit products," he adds, "but they have nothing that will even approach the performance of our product".

Zilog rates the chip at five mips. This performance, combined with on-chip cache and memory management, will make it the first true "mainframe-on-a-chip", says Guzman.

He says one major benefit for users that will result from the chip's performance is the ability to run mainframe operating systems. But he declines to say which of

these might be offered.

The signing of NEC is a follow-on agreement from the legal settlement between the two companies over NEC's disputed manufacture of Zilog's eight-bit Z80 microprocessor.

Now that has been settled, and NEC has an official licence to second source the chip and several other undisclosed devices, Zilog has agreed to second source NEC's 765 floppy disc controller, 7220 graphic display controller and 7261 Winchester disc controller.

Guzman sees the link between the companies as "mutually beneficial, with a long future". NEC is also a second-source for the Intel 8086, the 16-bit processor that has scooped most of the market from Zilog's Z8000.

## IBM hit by chip famine

THE worldwide semiconductor famine, particularly for microprocessors, finally hit IBM last week - but it is not alone.

As demand for IBM-compatible micros continues to mushroom, so the supplies of Intel's 8088 chip, crucial to both IBM and its imitators, have become short, forcing Intel to ration its customers and introduce a quota regime to keep them at least partially satisfied.

In IBM's case the shortage, coupled with an incorrect forecast on demand, has slowed production of its Personal Computer (PC) at an extent that it has told its dealer network only 25 machines a month may be ordered by each outlet.

This news came only a week after demand was stimulated when IBM announced price cuts on the PC of up to 20%.

This has angered dealers who had been led to believe supplies would be no problem, particularly since IBM opened a new PC production line at Greenock in December.

Richard Holway, marketing director of Hoskyns, one of the leading independent suppliers of the PC, says the quote is inadequate. "We could easily fill orders for over 100 machines a month," he adds.

"If this were any other company, I would accuse the right hand not knowing what the left is doing."

Less pessimistic is Byte Shop's IBM sales executive Michael Singer. He says his company has six outlets.

"This could be catastrophic timing by IBM as companies, particularly large corporations, will just be starting to free their budgets for the next financial year, and big orders could be lost."

An IBM spokesman admits that the root cause of the problem is lack of Intel 8088 chips, but says the same problem will hit many other manufacturers.

He described the situation as embarrassing. "We view this as a short-term problem only and expect to meet our 1984 production targets."

IBM has not released its 1984 production target, but in the US Don Batridge, vice-president of the microcomputers division, says the company plans to triple the number of PCs produced last year to around two million units.

The company is also investing \$500 million in the division this year.



MACFARLANE... "Anderson-Jacobson is final piece of jigsaw."

## Hyperion pulls out of UK sales

by Keith Holder  
HYPERION International, part of the Canadian-based Bytes-Com term, has relinquished its last hold on UK sales operations and has appointed Anderson-Jacobson as its UK distributor for the IBM-compatible portable Hyperion microcomputer.

Hyperion's UK sales office has closed, but Trevor Duplock, the company's European sales and marketing manager, says no jobs will be lost.

Existing staff will be redeployed in the company's European headquarters, on the same site, or will move to the parent company's offices in Montreal to help with machine designs for the European market.

Managing director George MacFarlane - who set up the UK operation when Bytes took over his company Gulfstream Technology - is among those heading to Canada. He will take up a senior management position.

The move signals the end of a long-standing disagreement between the companies.

Anderson-Jacobson sells an OEM version of the Hyperion micro as the Ajile. This name will be dropped now, says a spokesman for Anderson-Jacobson.

"It will clean up the conflict of interests and also make marketing of the machine more logical for both parties," adds Duplock.

Anderson-Jacobson will now be free to sell the Hyperion machine, though European support will still be provided by Hyperion's European headquarters. It has also recently been appointed distributor for ACT's Apricot and Sirius micros.

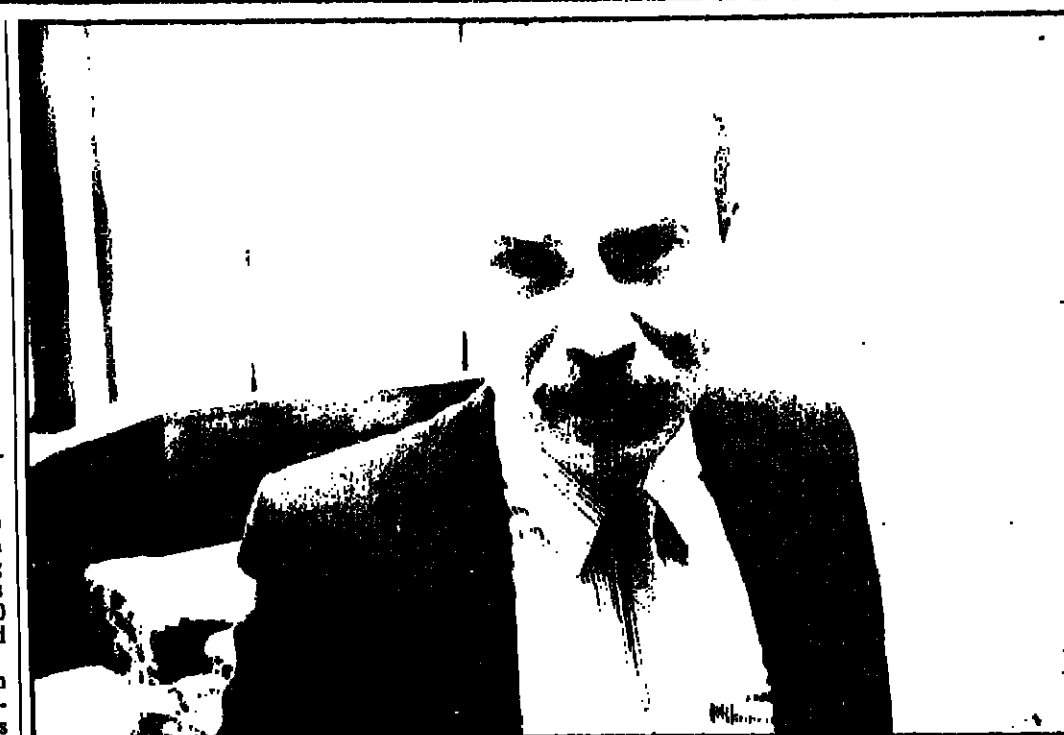
In the UK Hyperion started as a European-based sales organisation built around Gulfstream Technology. It has now effectively been pulled out of its original activities and has become a Canadian parent.

"The appointment of Anderson-Jacobson is the final piece of the jigsaw," says MacFarlane. "It ensures that we have strong distribution in every key market throughout Europe."

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SUMMERS... "The real way ahead lies in standard cells."

## Texas opens CMOS gate

by Robert Parry  
TEXAS Instruments has turned to CMOS for its latest push in the semi-custom chip market. It has brought out gate arrays with 300 to 1,000 useable gates, and a 1,500-gate device is waiting in the wings.

The new chips are all part of Texas' strategy to provide a long-term integration route based on an enhanced CMOS technology.

"Designers want to integrate more and more logic gates on to chips," says Tim Summers, European marketing manager for semi-custom devices at Texas. "Logic arrays and standard cell devices give them what they want."

The general trend to give high levels of integration will definitely be CMOS.

Summers believes the real way ahead for integration lies in standard cells, where all levels of the chip are customised to fit together a series of standard functional cells pulled down from a library. These give smaller areas for a given set of functions, but have higher design time and cost so are best suited to high volume runs.

"Texas does not have plans to produce large gate count (more than 3,000) logic array devices," says Summers. "We feel that standard cells are the better way. But

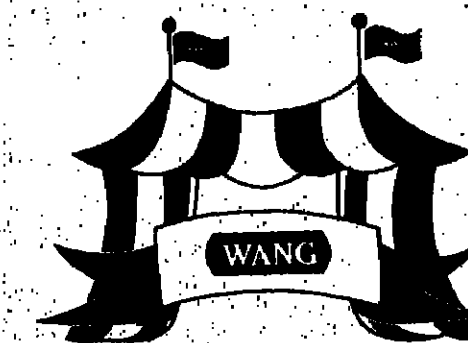
there will be a short-term demand. "There was a demand for a second source on the Fujitsu devices, which arrays always beat standard cells on design cycle time."

The new Texas arrays are an independent venture, he emphasises, and are not second-sourced from Fujitsu. Neither do they overlap the 2,000 to 8,000 range spanned by the Fujitsu devices Texas builds.

A second source will be signed up in a few months. The plan is to be self-sufficient in Europe on all semi-custom products.

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## PROFILE

# Encore for a boss who is worried by too much cash

GORDON BELL, founder of the Computer Museum in Boston, has a deep sense of the history of computing. No mere antiquarian interest, it arises from a vivid appreciation that each computer generation faces similar problems to those encountered in earlier ones, but has to rediscover how to go about solving them.

Until recently, Bell was Digital Equipment Corporation's vice-president of engineering. There he was the man responsible for DEC's Venus project to produce the successor to the five-year-old Vax 780

by John Riley

minicomputer, and as such is used to thinking and planning a decade or so into the future.

From both perspectives — of the past and the future — Bell holds views about the present that cut against accepted industry thinking. He has literally laid his money on the table to back up those views by leaving DEC, to join start-up company Encore Corp of Boston.

Bell wants to foster creativity in the industry, but sees many practical problems. He believes that too much cash can hinder rather than help the advancement of significant new technology; that companies which are totally market driven are doomed to failure; and that the computer industry is essentially evolutionary rather than revolutionary.

He says injection of government cash, cash from venture capital companies and cash from companies' own R&D budgets do not necessarily help the long-term growth of the industry.

"I see signs of too much money in the industry. It's like oil — if you've got enough, things run smoothly, but if you've got too

much things get clogged up." He points to many US companies which spend a lot of time writing proposals for available cash, especially from government. "All too often a lot of work goes on, a lot of money gets spent, and the whole system is happy, but there's no output," he says.

And he talks of the problems most established companies have in breaking significant new ground. "Since most mainframe and minicomputer manufacturers regard selling to the installed base as their market, they will have a hard time reacting to the micro which spans a larger market."

"If a company is market driven there is no way it will make the transition from one technology into another. A true market-driven company will go out of business as it will remain traditional and not evolve because technology changes."

Bell joined Digital Equipment Corporation in 1960. He designed the company's PDP-4, 5 and 6 computers, also the PDP-11, the first 16-bit minicomputer. He helped design the Vax 780 32-bit minicomputer, and was in overall charge of the Venus project to produce the successor to the Vax 780, expected to be announced at the end of this year.

In 1966 he took six years off from DEC to become a lecturer at Carnegie Mellon University. "It was a period of consolidation. I wrote books, did research, and helped to define and develop products. I went to Carnegie for freedom, but found I was a slave to managing contracts and running projects with graduate students."

Bell went on to become DEC's vice-president for engineering, and had 6,000 people working for him in engineering.

While reluctant to talk about



BELL... "I see signs of too much money."

DEC, two impressions come through: his pride in the technical achievements of DEC's engineers, but also a certain frustration with DEC's marketing.

"The people in engineering are incredibly good," he says. "The main thrust has been to make the Vax an all-pervasive product line from micro to mainframe and to have two forms of cluster. At the top and there will be multiple Venuses in a Vaxcluster, and then there are the MicroVax in clusters on local area networks."

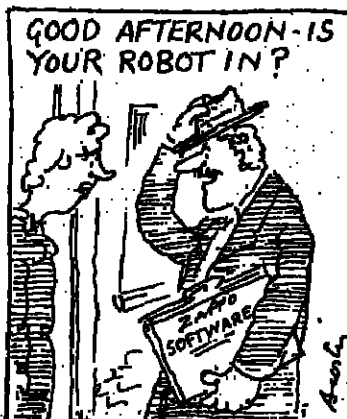
Bell is disappointed that recently DEC has not marketed its products as well as it should. "The Vaxcluster is an impressive piece of engineering, but the poorest piece of marketing I've ever seen," he says. "I'm surprised you have even heard of it," he laughs.

While in DEC, Bell influenced several major decisions, including the one to invest heavily in Gene

Amdahl's supercomputer company, Trilogy. "Amdahl is one of my heroes and a friend."

Bell emphasises the continuity that runs through the industry. "Take Ferranti's Atlas machine, which was built by 1962 with a 27-bit address. The DEC System 10 and 20 had 32-bits address and paging like the Atlas, but 15 years later." He adds that people are still rediscovering techniques used in the Atlas machine, and that similar addressing problems have been encountered by the mini- and then the micro-makers.

Bell affirms that the key to the future is to use a large number of microprocessors in some sort of parallel structure to enable micros to compete with minis and mainframes. "We are doing it for a lot of cases right now, and a lot will happen in the next five to 10 years," he says. "It is hard though, and is disappointing that it has taken so long."



## Artful warning

PHILIP HUGHES, chairman of software house Logica, delivered his verdict on Silicon Valley — the original one in the US during a recent lecture on high technology in the City.

He described the place as a cultural desert, an architectural nightmare that should serve as a warning for planners of high technology complexes the world over.

He was equally disturbed by Japan, where the pressure to compete, conform and participate was almost audible, he said (not quite in those words).

Such comments may seem surprising, from a computer man. But they fit in perfectly with Hughes' belief that as the rate of technological progress increases, so should spending on the arts, or we all go mad.

Hughes, himself a painter, is concerned about the effects of suppressing the artistic tendencies of man. His concern would seem to be justified by the alarming divorce rates among those who work or live in Silicon Valley, and perhaps also by the almost manic desire of the Japanese to get to work.

## 10 YEARS AGO

FROM COMPUTER WEEKLY OF MARCH 24, 1974: The formation of what could be Europe's biggest computer services and software company was likely to be a result of a decision by Segel

and CAP-France to combine with 1,500 employees... DEC launched in the US its first microprocessor, an eight-bit LSI chip based on the Intel 8008 chip.

There is a riot in Tokyo when the train drivers go on strike.

## Truth will out

ALVEY boss Brian Oakley confessed last week. At a conference he stood up to answer the question: "Have you ever started or run an IT company?"

His reply: "I'm a civil servant, so I've never done anything useful."

Chad

## PLATFORM

## Users of vision can bring efficiency to the software market



THE discussion on bespoke or packaged software (Platform, Computer Weekly, January 19 and February 23) has been carried out from the point of view of the prospective suppliers. Does not one think of what can be done for the users?

The bespoke argument is that a manager can have the policies he wants implemented in specially written software. The package argument is that a package costs one-third or less of what a bespoke system would cost, and the maintenance is cheaper.

In the real world, however much lip service is given to defining policy, most businesses are run following ad hoc decisions of the moment and policies can only be perceived after the event. A data processing manager who sought to acquire software because it suited his company's policies would soon come up against an exception to policy, and therefore function, that would be expensive to sort out.

If there are a few companies to which my remarks do not apply, how do they survive in these days of flexibility and quick response?

The supplier of the package quoted at £30,000 is after the most for the least. The prices charged to the largely captive package users for add-ons would make any motor vehicle spare part organisation blush with shame. In the payroll business the rumblings have not stopped yet over the charges made for SSP facilities.

So much for the provision of statutory requirements by your package supplier!

Every user's requirements are different. No user has a particular requirement unique to him. From these universal truths we can logically reach the conclusion that if only we could find out what all those particular requirements are we could put an appropriate set together to suit any and every user.

So get to it both package and bespoke suppliers — no one has yet produced such a package. The joy for the user is that he would be able to select that this week he will have this and this, while next week it is that and that.

Have you noticed how much easier it is to pick what you want from all that's available than it is to think out what you want by intellectual effort? I know that's how our trolley gets filled up in the supermarket.

A package on the lines suggested

would cost a lot of money to create. The creator would want to charge at least £30,000 for it. And so he could but for a little thing called competition.

If there were three packages with this type of facility the competition would be interesting. Prices would tend towards the incremental cost of delivering the goods produced for a further sale.

Cost of those goods in the form of a set of manuals and a magnetic tape: say £100. A great shock to package suppliers.

Recovery of the big initial investment is volume dependent and it is possible to look forward to some interesting changes in the software produce market in the next few years.

**Product planning as performed by consumer-oriented companies is unknown in the services trade**

Business will be by no means black for the package supplier. If software products of the power we describe became available, the users will need a lot of help to get full value from the package.

The user has freedom. He can do what he wants with flexibility and a quick response. But he will need advice on the best way to achieve the ends he seeks.

The ongoing revenues of the package supplier can increase, as they must to provide the true return on the initial investment in product development by providing business and systems advice.

What I have tried to do is to bring together the technical possibilities of software packages with the economics of the marketplace.

Product planning as performed by consumer-oriented companies is unknown in the computing services trade. A succession of users who can see how the trade is developing can do more to bring about an efficient market and then enjoy the benefits it brings than any number of stumbling suppliers.

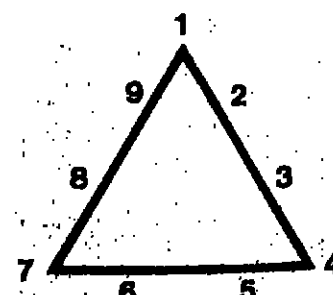
Cliff Dillaway

Cliff Dillaway is an independent consultant who specialises in software contracts — especially those that have gone wrong. His book, *Purchasing Computer Software Products*, will be published by Cower later this year.

## PUZZLER

IN this triangle, the three sums-of-the-squares of the four numbers along each side are respectively: 30 (1<sup>2</sup> + 3<sup>2</sup> + 4<sup>2</sup>), 126 (4<sup>2</sup> + 5<sup>2</sup> + 7<sup>2</sup>), and 195 (7<sup>2</sup> + 8<sup>2</sup> + 9<sup>2</sup>). The numbers at the corners are used twice each.

The problem is to rearrange the nine numbers so that the sum-of-the-squares is the same for each side, rather than different as above. See page 79 for solution.



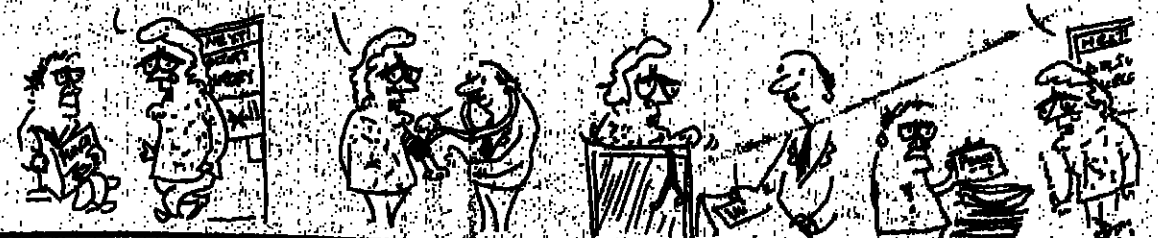
## Liveware File

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by Don

# Computer Weekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, March 29, 1984

## Panic strikes Wall Street's geese

SINCE the deregulation and breakup of US telecommunications giant American Telephone and Telegraph, it has been reckoned that the company would make a big move into the traditional data processing markets. Much already has been written of the coming battle between IBM and AT&T, which are expected to fight tooth and nail to assert their dominance as information technology companies.

This week AT&T finally made a major announcement of computer products. And on the eve of the announcement, a rather surprising event occurred.

New York brokers picked up news that the announcement was imminent, and passed the word to their clients. The result, according to one broker, was a mad rush of people falling over themselves to sell their shares in Digital Equipment.

Why sell DEC shares? The brokers predicted that the AT&T computer systems would include a minicomputer to compete with DEC's Vax line, and other competitive office automation products.

The New York Stock Exchange, overwhelmed by the surge in trading late in the day, suspended further dealings in DEC shares. The act is not without precedent, and the number of DEC shares actually traded, 216,000, was not outrageous. The shares closed down at just over one dollar for the day.

DEC was no doubt as surprised as we were. The company has been having its ups and downs lately, but no-one could presume that AT&T's entry into the computer market would drive the second largest company out.

Maybe DEC should moan to the New York Stock Exchange about its inefficiency, and then attempt to sell it another computer.

Certainly, AT&T is going to send some feathers flying, and also as certainly, many investors are silly geese.

## Don't suppress facts

WHAT relevance does the Sarah Tisdall case have for the computer industry?

She is not a programmer, or a systems analyst. The "secrets" she passed on were not stolen from any computer.

Yet the issues surrounding the prosecution and imprisonment of Tisdall, who passed information to *The Guardian* about the delivery of cruise missiles to the UK, does concern our industry.

We agree with those who sense an increasing desire on the part of government to suppress information as to how and why it reaches particular decisions.

The present government, however, is going well beyond what could be considered acceptable practice.

The tardiness of the government in its promises to legislate on data protection is one example of how its preoccupation with secrecy has affected the computer industry.

Yet the problem goes deeper. Some senior computer industry figures now are complaining that debate is being stifled on important issues.

For example, three years ago, when *Computer Weekly* broke the story that the "Camelot" project to automate portions of the social security payments scheme was to be scrapped, we heard that there was a "witch hunt" by Department of Health and Social Security officials to locate the individual who leaked documents to this paper. Yet if the story had not been leaked, how many more millions would have been wasted on an inadequately conceived programme?

The tendency to suppress this kind of information has always been there. Now, however, more muscle is being put behind the tendency. The current government often cites the US as an example of free enterprise, and admires the success of its information technology industry.

Should it not look to the US, then, for the example it has set in freedom of information?

## 1984 and all that...

THIS week's example of the strange things people say about computers was sent in by Jane Silverstein of Newbury, Berkshire, who writes:

Many try to analyse the effect that nations have had on their attitudes to life, to work, to men, and to their own families, but the complexities are too great for the best programmed computer would be hard put to it to draw satisfactory conclusions.

## LETTERS

## Amplifying the case for Tandem NonStop kit

READERS of the notes taken from Gordon Bell's BCS Jubilee Lecture (*Computer Weekly*, March 15) could form too narrow a view, I feel, of Tandem's marketing of its NonStop computers.

Tandem certainly pioneered "reliable computing", and made a very good job of it. But to talk of us occupying a market niche is inappropriate, when the main competition is from IBM. In any case, it would be wrong to suppose that the main platform on which we operate is fault-tolerance.

Tandem offers modularity in its NonStop systems: a modularity that embraces both hardware and software. This means that users may expand their systems from two linked processors to (literally) several thousands.

So a big plus for Tandem is not only the fault-tolerant aspect of its system modularity, but the increasingly important capability to increase the installed system, or network of systems, without any change to the software, or disruption to the users.

More than ever before, Tandem is in the market of continuously expandable systems, and it will continue to grow through service of the needs of online transaction processing environments.

This amplification should help the readers of Gordon Bell's undoubtedly authoritative piece, I feel.

PETER HERMON  
Managing Director

Tandem  
London SW1.

## When to check references

CONGRATULATIONS to Alan Williams ("How to Identify Losers in Your Team", *Computer Weekly*, March 8) for highlighting the usefulness of reference checks in the recruitment process. As a means of testing judgments made at interview they are invaluable. However, his analysis contains two assumptions with which I would disagree.

First, the common excuse that the only pertinent reference is the applicant's present boss is just that — an excuse. With the current level of job mobility, the instances where it is impossible to obtain a reference from someone who has recently worked with (ideally over) the candidate are extremely rare.

Second, he ignores the emotional commitment on both sides that is achieved even by the offer stage.

Let alone when the job has been taken up. Having arrived at a final choice after what may have been an arduous process; what happens if the current employer's reference is a bad one? Does the recruiting manager trip gaily off to his second choice having blighted his previously favoured candidate's chances of further progress in his current firm? Does he have a second choice? Like radiation, the strength of all short lists decays over time.

The answer is to take up references before any offer has been made — not with the candidate's current firm but with previous employers or business contacts.

I do the objection that people will not supply the names of referees who will do other than cover them in glory my response is that (a) experience does not bear this out — one referee I phoned described the candidate as "possibly brilliant, certainly certifiable" and (b) objecting to revealing the name of a suitable referee from a previous employer is much more suspicious than objecting to making contact with the present one.

Williams is right that external recruitment consultants are not inherently less fallible than the rest of mankind. We are, however, in a better position to give the recruitment process the time and priority that it deserves, including the taking

up of references as a powerful way of increasing the usefulness of interviews, in assessing shortlisted candidates against the specific requirements of the job.

PETER LEWIS  
Managing director

Egor International  
London W1.

## Beating staff shortage

THE computer industry is having to face up to the problem of staff shortages, but I can remember other great shortages of miners, of pilots and of doctors. But the problems were cured.

Concentration upon the most efficient methods will reduce demands. We should follow the goal featured in your extracts from *Database Management Systems* (*Computer Weekly*, March 8) of "wasting as little time as possible in considering non-runners". One way to do that is to use a computer to match capacities and requirements.

Manually, the task of checking everything in advance can prove surprisingly heavy going. If a mistake occurs, the time and cost are of course ludicrous. So, one answer is to use a computer!

M. R. HAMLIN  
Atlas Computer Consultants  
Bolton.



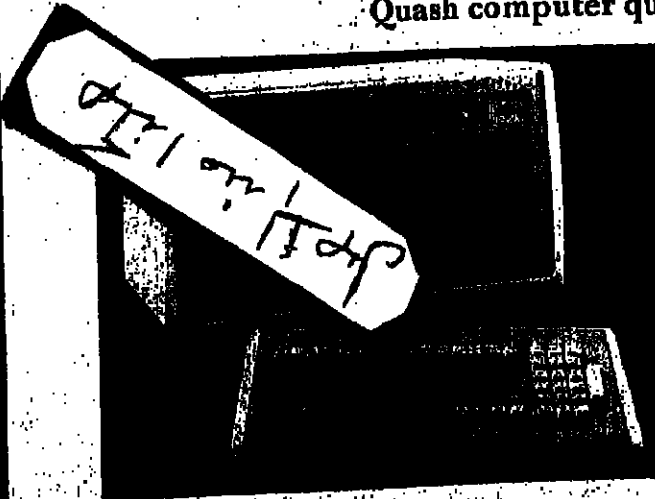
## This is ridiculous!

Don't put your customers in this position by selling PCs to businesses that are liable to grow. We all know that a business might start by buying a computer with one job in mind, but it seldom stays that way. If it's bought for accounting, they'll soon get the idea of adding financial planning, word processing and numerous other applications.

In a business that's growing that means more and more people will want to use the computer, eventually at the same time. And if you've sold them a PC they can't.

On the other hand, if you'd sold them an Equinox multi-user multi-processor system at the start, they could have expanded as the need arose.

## Quash computer queues with Equinox



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Our networking capability also lets you connect to a wide range of other systems and devices: Prestel, mainframes, Telecom Gold, terminals, to name but a few.

CP/M 80™, CP/M 86™, MS DOS™, MIBOS™ are some of the operating systems we run. And for real high-speed multi-processor networking power there's the TURBO™ operating system.

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## PEOPLE



■ Data General distributor Crelion Microsystems of Slough has created a new applications engineering appointment, taken up by Mahendra Patel, from Thorn EMI Electronics.

■ Interactive Data Machines (IDM) has appointed Roger Batson as sales director. He joins the company from ICL and Compu-tervision Europe where he was marketing manager. Batson was with IBM UK's General Systems Division for 10 years.

■ Milton Keynes Development Corporation is widening the activities of its Information Technology Exchange to help meet increasing demand from companies and individuals in the City and the region. Michael Roberts, the corporation's director of finance, has been appointed managing director of the Exchange and Andrew Laing, the corporation's data processing manager, will take over the day-to-day management.

■ Counting House Computer Systems has appointed Alan Hopkinson as sales executive for the North and Scotland. He has spent six years as general sales manager with Mills Marketing Services.

■ The CAP Group has recruited two new staff. Colin Knight joins from Systime as UK training manager and Vicki Billington comes from James Baker Associates as a senior lecturer.



■ Currys Micro Systems has appointed Chris Thorpe (left) as training manager. He previously worked for Hart Computers and Control Data. Jim Reed (centre) previously manager of Currys Micro Systems Micro-C branch in Leicester, becomes marketing projects manager, and Andrew Harris (right) is named as marketing controller, a new position in the company. Harris has been with Currys Micro Systems since 1980 as financial controller.

■ Mike Brockway, Mike Long and Ken Willis have been appointed to the board of Rediffusion Simulation as engineering, marketing, and personnel and production directors respectively. Brockway, formerly chief engineer, began his career with the company in 1956. Long, formerly general manager, marketing, joined the company in 1961 as a project assistant and moved into the marketing and sales area in 1965. Willis, formerly general manager, production and product support, joined in 1954, and has held a number of senior production management posts.

■ David Grundy, head of the Ferranti Microelectronics Centre at Chadderton, Lancashire, has joined the board of Ferranti Electronics. He has been a leading contributor to the development of the Ferranti ULA, the semiconductor technology which has given Ferranti a large share of the world market for semi-custom integrated circuits.

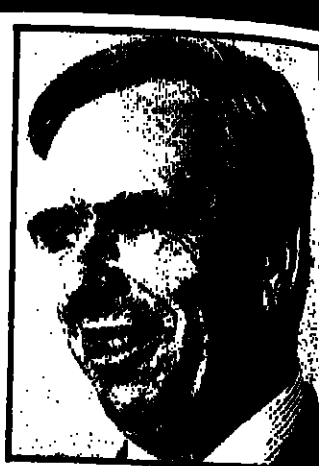
■ Dilog has appointed Thomas L. Scott as director of international marketing of Dilog products with the exception of North America.



■ Computer Automation has appointed Paul Sherrington as senior sales executive within its Commercial Systems Division, responsible for selling DP applications, and advanced office systems to key accounts in the South-west and Hampshire. Previously he was a sales executive with Sperry for three years. Dick Wilkinson becomes area sales manager within the Commercial Systems Division, responsible for sales of the SyFA family of distributed data processing and networking systems throughout Surrey, Sussex and South-west and South-east London. Before joining Computer Automation, he was with MDS Computer Systems for seven-and-a-half years. Mike Bellhouse is named as marketing support consultant within the Naked Mini Division. Prior to joining Computer Automation, he was with Oriel Computer Services as senior analyst.

■ Phil Gordon has been promoted to field sales engineer at Crelion Microsystems, to cover the West of England. He was an internal sales engineer with Crelion, and before that was employed by Thorn EMI Electronics.

■ Philip Thwaites has been appointed group marketing director of the A. J. Gooding Group. He was previously marketing controller of Casio Electronics Co from 1981.



■ Tony Thorne has resigned, for personal reasons, as managing director of the Guernsey-based software manufacturer Dynastech Microsoftware. John Marjoribanks (above), general manager and David Monks, DMSL UK marketing manager have been appointed directors. Marjoribanks will be in charge of Guernsey-based operations, and Monks will be primarily responsible for UK sales and general marketing strategy. Thorne will act as consultant to the company.

■ Almarc Data Systems has appointed a new general manager, Tony Morris, who since 1979 has been managing director of Pipeline Controls (Nottingham). He is a chartered accountant.

## PEOPLE

■ Colex (UK), Ascot-based supplier of boards and systems, has appointed Nick Coxhead as applications engineer. He joins from Celdis where he spent 18 months as support engineer, responsible for the Mostek account.

■ LMR Computer Services of Maidenhead has expanded its customer services department and has taken on two additional members of staff. Glenda Rousseau becomes customer services executive for LMR's library management and information retrieval software, Adlib. An Australian, she came to England in 1974, and her last position before joining LMR was based in London, at Aslib, an association for specialist librarians, where she was senior consultant. David Poulton another customer services executive, has worked for three years at a software house installing accounting and reservation systems for travel agents.

■ Interface Network, a new British microcomputer retail company, has appointed Ronnie Colvin as product manager, with responsibility for evaluating and selecting the products carried by Interface centres. He joins from ICL where he was dealer sales manager. Prior to that, he spent five years at Sperry Univac, where he was director of systems operations. Bryn Jenkins has been appointed information systems manager.



■ Prime Computer (UK) announces the appointment of Anabel Perahia as support manager, Commercial Systems Group in the City of London District. She was previously principal analyst in the same district, and before joining Prime, was a software consultant for two years for the time-sharing company Rapidata International.

■ North Star has named David King as UK sales and marketing manager. His background covers sales and marketing positions in DBC, Centronics and recently, Apple UK.

■ Julie Hewitt (below), previously with ADP Hotel Services, has joined Multicomputer as sales support engineer, concentrating on pre-sales and training activities.

■ Dermot O. S. Hoare (above) has been appointed managing director of Hitech Consulting Group (UK), a new London-based recruitment subsidiary of Informa (Paris) and Hitech Consulting Group Inc (Los Angeles). He previously held directorships in two British recruitment practices, and, prior to that, management positions in the chemical and building industries.

■ Jane Tozer, F International business development manager, has been elected to the Council of the Parliamentary Information Technology Committee (Pitcom).

■ Surrey-based Kewill Systems has appointed Bill Rowbottom as Midlands area manager with the responsibility of setting up and running the new office.

■ Jeffrey Thomas and Tony Humphreys have joined MSI Data International as regional manager, and systems support manager, respectively. They will both work in the South and South-west.

■ Taurus Technology has named Barry Lawrence as technical manager. He has recently worked as a consultant for Britannia Computers, and prior to that was technical director of Diklat.

■ The board of BIS Insurance Systems has appointed Keith Williams as managing director and Peter Cross as marketing director. Williams joined BIS as European sales director in September 1981, from IBM, where he had been involved with systems and sales in the insurance and banking industries for seven years, and as product manager, with the launch in the UK of the System 38. Cross joined the board of BIS Insurance Systems last July when BIS acquired the two Cross companies now known as BIS Solar. He was previously founder and managing director of Cross Computer Group and was the originator of Solar in 1977.

■ Michael Daw has joined DPCL (UK), as financial controller. His previous experience in the computer industry includes two years as a financial accountant for Datasilk and most recently, he was a senior financial accountant for Hewlett-Packard.



■ John Evans (above), has been appointed managing director of Exxon Office Systems (UK) Ltd. He has over 20 years' experience in data processing, office automation and communications, and began his career with IBM. He was chief executive of Ansafone and before joining Exxon was managing director of Comdial UK.

■ Microware Computers has made Richard Palmer, formerly of IBM, sales manager; and Gary Williams, formerly of Cifer Systems and Control Data, technical support manager. Norman Palmer, Mike Doran and Robert Lilley become sales executives; and Ann Abbot, support executive.

■ Sigmex has appointed Mark Elliott sales executive, responsible for sales of the company's range of computer graphics display terminals and systems in North London and the Northern Home Counties. He comes from process control system manufacturer Negretti.

■ Daisy Terminals, an authorised Qume distributor, has restructured its sales force. Bill Booker has been appointed UK sales manager based at head office in Haywards Heath. He was a salesman with STC for 18 months, and at the Pitney Bowes Group of companies as salesman, and later in management, before taking up his appointment with Daisy. Bill Longmore has been appointed Northern area salesman based at the Newcastle-under-Lyme office; and at central office in Maidenhead, Dave Bradstreet has been appointed salesman to cover the central section of England.



■ Wordplex has appointed Sue Cooper (left) UK customer training manager; Jayne Wootton (right) software librarian and Mo Wright (centre) marketing support manager (international division). Cooper will liaise with the regional training co-ordinators in the provision and administration of training courses. Wootton adds software librarian UK to her existing role as marketing assistant; and Wright will be responsible for providing marketing support for Wordplex dealers and subsidiaries abroad.

## CONFERENCES

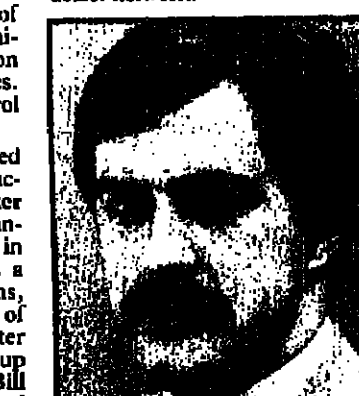
■ A THREE-DAY seminar, Microcomputers in Corporate Information Systems, will be held by Frost & Sullivan from April 11-13 at the Park Lane Hotel, London. Admission is £425 plus VAT. The state of the art of microsystems and their advantages will be examined. Guidelines will be supplied on how to select, implement and manage a microcomputer system including technical and administrative support, control procedures, usage guidelines, and educational assistance. The seminar is intended to support technical specialists, DP managers, users and information resource planners. Full details are obtainable from Carolyn Budd on 01-486 0334/5.

■ A SERIES of seminars covering three days is to be presented, by the NCC, in conjunction with Software magazine and Computer Weekly at the Software '84 Show. The seminars will be held at the London Tara Hotel from June 5-7. The subjects will include: 16-bit operating systems, local area networking, mainframe operation,

■ DRG Business Systems has appointed David Shakeshell systems manager of the company's newly formed PC and network systems group. Before joining DRG, he was network and communications manager at Planning Consultancy, a London IBM-PC dealer. Previously, as sales support manager at Zynar, he specialised in local area networks for Apple and IBM microcomputers. DRG has also appointed Kevin Tegg as sales executive with responsibility for the IBM-PC. He joins from Zynar.

■ Compass Peripheral Systems has appointed Rob Owen as sales manager. Having obtained an engineering degree at Bristol he joined the CEEB in 1972 working in a computer group specifying and modifying software for power station control until 1975. He then worked for Instrum and in 1978 joined Rapid Recall as applications engineer with a brief to help customers apply DEC computers. When he left he had been promoted to technical franchise manager.

■ Interface Network, a UK microcomputer retail company has appointed its first general manager, Frank L. Turner. He comes from Digital where he was responsible for the launch of the PC range, and for setting up a UK dealer network.



■ Bill Daly (above) has joined the Cambridge-based computer aided design group, Prosys Technology as consultant engineer. Dr Daly was formerly a chemical engineer with British Nuclear Fuels.



■ Wordplex has appointed Sue Cooper (left) UK customer training manager; Jayne Wootton (right) software librarian and Mo Wright (centre) marketing support manager (international division). Cooper will liaise with the regional training co-ordinators in the provision and administration of training courses. Wootton adds software librarian UK to her existing role as marketing assistant; and Wright will be responsible for providing marketing support for Wordplex dealers and subsidiaries abroad.

## DIARY

**MARCH 29**  
Hands-on Microcomputers. MSS Services two-day course. Worthing. For details phone Marcia Gray on (0903) 34755/6.  
Introduction to dBase II. Merit Computers course. Sunneyslands Hotel, Wimslow, Cheshire. £95. Further details from Karen Blackshaw on (0942) 495821.  
The Electron and the BBC Micro User Show. Four-day show, New Horticultural Halls, London. For details phone Susan Lipman, on 061-456 8383.

**APRIL 2**  
Computer Auditing. Frost and Sullivan three-day seminar, Hyde Park Hotel, London. £425 plus VAT. For details phone Carolyn Budd on 01-486 0334/5.  
Computer-assisted Decision Making. Unicom Consultants three-day course. Tara Hotel, London. £475 with discounts for members of ORS, BCS and staff of academic institutions. Details from Mrs J. Valentine on 01-940 7716, or 01-940 5181.  
Context. Systems Designers' five-day course. Primley Hall Hotel, Camberley, Surrey. £540. For further details phone Keith Evans on (02514) 22161.  
PL/I Consolidation. Altergo four-day course. London. £450. For details phone 01-486 7288.  
Advanced Systems for Non-DP People. BIS Applied Systems two-day course. Kensington Palace Hotel, London. £285 plus VAT. For details phone Cherry Bignmore on 01-261 9237.  
End-user Computing for IBM Users. Xephon two-day seminar. Selfridges Hotel, London. £390. Details from Mary Haines on (0628) 74922.  
Relational Databases. Frost and Sullivan three-day seminar. Cumberland Hotel, London. £425 plus VAT. Details from Carolyn Budd on 01-486 0334/5.  
Cambridge Rings. University of Kent three-day course, Canterbury. £150 for academic participants, £225 for commercial participants.

**APRIL 3**  
Decus 1984 four-day annual conference, Exeter University. For details and registration phone Tania Morgan on (0734) 853250.  
A Better View of Data. BSC London North-West. Jim Dove, Mecca Bookmakers, Monksdene Hotel, London. 7.45 for 8.00.  
VS APL Fundamentals. Cocking and Drury four-day course. 16 Berkeley Street, London. £330 plus VAT. For details phone Alice Ingile on 01-493 6172.

**APRIL 4**  
Computer Graphics. BCS Humberston, Grange Park Hotel, Wiltshire. 7.30.  
UK Info User Group Conference. Bloomsbury Crest Hotel, Corn Street, London. 10.00. £15 members; £20 non-members. Talks on applications by Shell and ICI Billingham, and report of US Info User Conference.  
Inter-personal Skills - Transactional Analysis. BIS Applied Systems' 2½-day residential workshop. Kensington Palace Hotel, London. £415 plus VAT. Details from Cherry Bignmore on 01-261 9237.  
Strategies for System 38 Users. Xephon two-day course. Berners Hotel, London. £390. For details phone Mary Haines on (0628) 74922.

**APRIL 5**  
Supercomputers. BCS London (Central). Dr Gene Amichl. Institute of Education, 20, Bedford Way, London. 6.00 for 6.30.

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## The Micro PDP-II

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Built for realtime multi-user, multi-tasking applications, it supports all PDP-II standard operating systems: RSTS/E, RSX-11M/Plus, RT-11, Microware/Pascal and DSM.

The Micro PDP-II comes either in desktop or pedestal mount format. It's available now stock from Rapid Recall who can give you the level of customer support and after sales service you expect from Britain's leading microcomputer distributor.



systems, choosing the right database management system, viewdata, micro-based expert systems and others. For further information and/or reservations please contact seminar administrators, NCC, Manchester. Tel: 061-228 6333.

■ Professor S. C. Loh, inventor of the Loh keyboard, has accepted an invitation to deliver the BCS annual lecture sponsored by Sperry at the Royal Society on July 4. Professor Loh's work on machine translation in the Chinese University of Hong Kong has received universal acclaim, and in addition a review of work in this field. Professor Loh will demonstrate the expression and translation of Chinese ideographs.

■ Professor Loh is head of the Department of Computer Studies and director of the Hong-On Research Centre for Machine Translation at the Chinese University of Hong Kong. He has held posts in Canada and Denmark. More details from the BCS projects office, 01-637 0471.



# CAD/CAM

## Beating design constraints

Computer-aided design/manufacture (CAD/CAM) is being boosted by government, writes John Lamb

GOOD design is an elusive quality, involving the materials, function and look of a product. Although we all recognise good design when we see it, setting out to produce a new motor car, building or processor chip is an exercise fraught with difficulty. All too often the complexities of the product and the constraints of time, materials and the brief conspire to defeat the designer.

Those who employ designers like engineers, draughtsmen and architects, have other things to worry about. They want to cut design time, get the manufacturing process sorted out and stay ahead of the competition.

Computer-aided design and computer-aided manufacture (CAD/CAM) help solve both problems. Computer tools give designers more time to work with their ideas and help in coming to grips with the complexities of the design process. At the same time, CAD/CAM cuts lead times and offers the prospect of more reliable design work.

"At a time when everything has been tight our CAD/CAM system has allowed us to switch markets using the same designers," says Roy Llewellyn, engineering computer systems manager at Aish and Co., a small electrical and electronic engineering firm.

"It has allowed us to increase productivity. In the 2½ years we have had CAD equipment, we have got 50% more output from our drawing office with less people."

For an outlay of between £250,000 and £300,000 on a Prime mini and associated software, Aish has a system with three graphics terminals capable of handling 2-D draughting work and 3-D solid modelling. Engineers can look at the mechanical drawings and three dimensional models of the artefacts they represent.

Llewellyn talks of Aish becoming a computer-aided engineering (CAE) company, adding project management and materials and production management systems to the existing drawing office system.

CAD/CAM has already paid off for the company, allowing it to move from its traditional field of Navy systems (switchboards, consoles and so on for ships) into civil work. Aish is currently working on a contract for a water treatment plant.

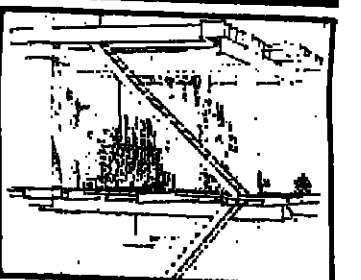
Aish is not shy of sharing its experiences, either. The company is one of 25 CAD/CAM users on a list of firms prepared to demonstrate their systems to first-time users. The scheme is run by the Department of Trade and Industry. Each month some three engineering firms visit Aish's Poole, Dorset, factory to inspect the system.

"From these visits I've got the feeling that we're trying to do a lot," says Llewellyn. "Traditional engineers and draughtsmen still

need a lot of convincing that it is not a black box destined to take over their work. We have to tell them they are still in control."

"In general, CAD/CAM is not as widespread as it should be and I am not convinced that it is growing in the right way. All too often people are told to investigate CAD/CAM because the company director has been to a seminar and thinks it is going to revolutionise his business. There is also a lot of hard work involved."

Aish itself spent 18 months looking at systems, before plumping for Prime and Cambridge International.



**Traditional engineers and draughtsmen still need a lot of convincing that it is not a black box destined to take over their work**

teractive Systems' Medusa software. "In fact we couldn't find exactly what we were looking for and ended up tailoring the system to our requirements," says Llewellyn.

"One thing we were sure of is that we wanted to buy a general purpose mini so that we could add systems to it in our plan to become a CAE company."

How many firms think like Aish? According to market research firm CAD Source, the estimated number of systems in use in Britain stands at 1,410. They are used by firms in mechanical engineering, electronics and building. Computervision, with an estimated 230 systems, is the biggest supplier, closely followed by Rascal-Redec with 200 systems either installed or on order.

In addition to these larger systems, there are a number of eight-bit micro-based products, the best known of which is probably the Apple-based Bit Stik which is said to have over 2,000 users in Britain.

Despite bullish predictions of market growth - 45% to 50% this year in North America according to Merrill Lynch and similar predictions for Europe - some 75% of British engineering companies make no use of computers. An IDC survey of 134,000 engineering firms found that only 14% possessed their own computer, and the missing 11% used some form

of bureau.

IDC expects 5,600 engineering firms to invest in their own system this year. The bulk of them, 4,900, will be companies employing less than 50 people, while the remaining 700 new users will be larger companies. Its report suggests that graphics and design applications are lagging behind other engineering applications.

"The cost advantages of CAD/CAM are difficult to prove," comments Brian Gott, manager of CAD Centre Consultants. "Simple-minded industrial costing methods have not been able to cost the time savings and this puts off many potential users."

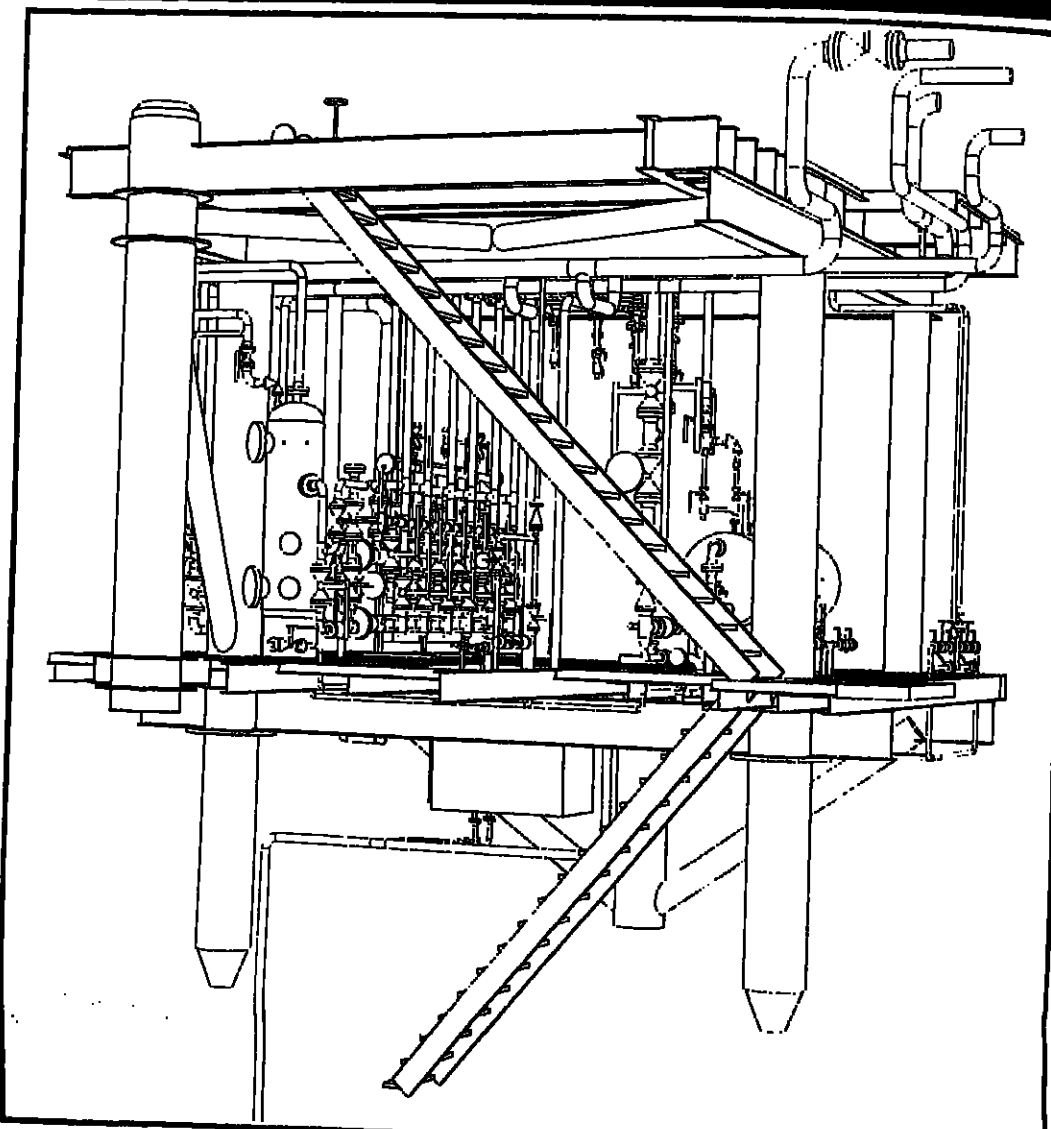
"However, we find a trend among users to be more sophisticated in their approach, to take a more strategic view of CAD/CAM. This involves taking account of a number of different benefits."

Gott highlights two advantages of CAD/CAM. "It tends to bring more discipline into affairs, which is liable to improve quality and brings the very considerable benefit of allowing work to be modified."

The majority of systems, Gott explains, are straightforward draughting machines. More sophisticated 3-D modelling is in its early stages, he claims. Much work on improving the user interfaces with modelling systems has to be done before they are widely acceptable.

But great strides are being made. It is now possible to buy a crude 3-D modelling system that will run on the Sinclair Spectrum. Developed by Palcom, the software costs around £10.

Historically, the most advanced users of CAD/CAM systems have been in the aircraft, automotive and electronics businesses. In electronics, for example, there are now over 30 bureaux offering



An offshore design by McDermott Inc. of New Orleans using a plant design management system supplied by Compelec.

systems for printed circuit board design.

Electronics firms, especially semiconductor manufacturers, are not only more alive to the applications of CAD/CAM, but also have a greater need for tools to speed up the complicated task of circuit design.

Inmos, which recently unveiled its Transputer processor chip, had to build its own CAD system to design the product. The system enables engineers to work on individual components and to match them with the overall system specifications. Inmos says that a system which allows it to combine design work with project control is not available on the open market.

The government, with the slogan "liquidate or automate" has played its own part in jollying

along CAD/CAM use. The Department of Trade and Industry currently runs three rather confusingly named schemes: CAD/CAM, CAD/MAT and CAD/TES.

The first scheme, CAD/CAM, with a budget of £16 million, was originally designed to boost awareness of the technology through seminars and demonstrations. It was widened last year to include production management, and money was also made available to fund the implementation of CAD/CAM systems.

The second scheme is CAD/MAT, which stands for Computer-Aided Design in Microelectronics and Testing.

With a budget of £9 million, CAD/MAT provides similar support to that available under the CAD/CAM scheme, except that whereas CAD/CAM is aimed at mechanical engineering firms, CAD/MAT's target is firms in the electrical and electronics industry. CAD/MAT also includes support for users carrying out their own systems development.

The largest scheme is the £24 million Computer-Aided Design and Test Equipment Support (CAD/TES) programme. This scheme provides for grants of up to 33⅓% of the cost of CAD/CAM systems, and was introduced because it was felt the earlier awareness schemes were not reflecting increased sales of equipment. The grants have a £40,000 ceiling and are confined to first-time users.

Designed to give industry a kick-start in CAD/CAM, the success of DoT's schemes is difficult to assess. Some £10 million has been approved under the CAD/CAM scheme since it started in 1981.

CAD/TES had to be extended because of the demand for grants and was altered to favour smaller engineering firms. If market predictions are anything to go by,

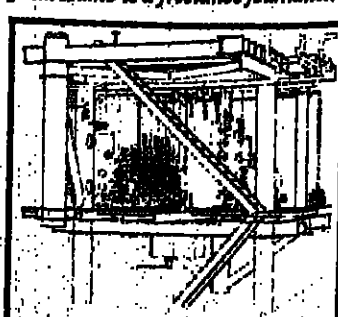
the government has had an impact on demand.

Unfortunately, British firms have not benefited greatly. Three have fallen into American hands since the scheme began, although this may be no bad thing since observers believe there are too many firms in the business chasing too little business. According to CAD Source, there are some 21 major systems suppliers in Britain.

One of the difficulties confronting users and suppliers is the best way to move CAD into CAM. In other words, how to integrate the design function with production planning, manufacturing and the management of the process. Not only will it be an expensive business but poses tricky problems of system design.

"Only when this is achieved will the full benefits of CAD/CAM be realised," says Gott at the CAD Centre.

John Lamb is a freelance journalist.



### CAD 84

An exhibition and conference about computers in design engineering takes place in Brighton next week. Sponsored by Computer-Aided Design and organised by Reed Exhibitions, CAD 84 is the sixth to be held and is at the Metropole from April 3-5.

## CAD/CAM

# Keep CAD on separate kit

Running CAD on existing hardware spells disaster - the environment must be dedicated, says Martin Banks

AS computer-aided design and computer-aided manufacture become more prevalent in industry, there will be a growing tendency for some companies to consider the possibility of circumventing potential problems of installing a dedicated CAD/CAM system by utilising their existing hardware.

The short-term advice would generally appear to be: don't. The CAD or CAM package is just another application, it has to be admitted, so for many potential users already equipped with a large and muscular mainframe or supermini, the temptation to use that hardware will no doubt be great. In practice, however, it is rare to find a CAD package running with other general purpose business applications such as accounting, payroll or database management.

Generally speaking, the golden rule is that a CAD system will normally require its own, dedicated environment. There are exceptions that prove this rule - and others that bend it just a bit - but in most cases it will hold true.

The reason is that in any general purpose environment the CAD/CAM packages will have to run time-shared with other applications.

As the majority of CAD work has a high level of graphics interaction as an integral feature, while

CAD can feature such complexities as multiple-axis machine control in real time, integrating such requirements into a general purpose environment is, in practice, extremely difficult.

CAD in particular is profligate with the use of a system's input/output capabilities. Complex high resolution graphics on multiple terminals running different tasks will rapidly absorb all the available

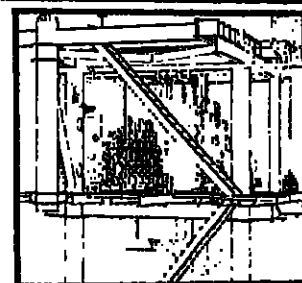
mainframe or supermini such a move is not always the most cost-effective solution.

Being able to dump the data to a disc file alone will not be sufficient for a working system. Given the cost of such graphics I/O hardware, when coupled to the type of workload that might make using a general purpose computer viable, developments in systems technology will tend to point the potential user towards dedicated microcomputer-based solutions.

Two exceptions to the general rule that dedicated solutions are the answer can immediately be identified, though others probably exist.

The first is where the workload is sporadic in nature, while at the same time being of high complexity. This might be where a design task involves a high degree of interaction between different design environments such as electronics, electrical, pipework layouts and mechanical stressing. Each might be within the scope of a small dedicated system, but the combination would require a much more powerful environment such as a supermini or mainframe.

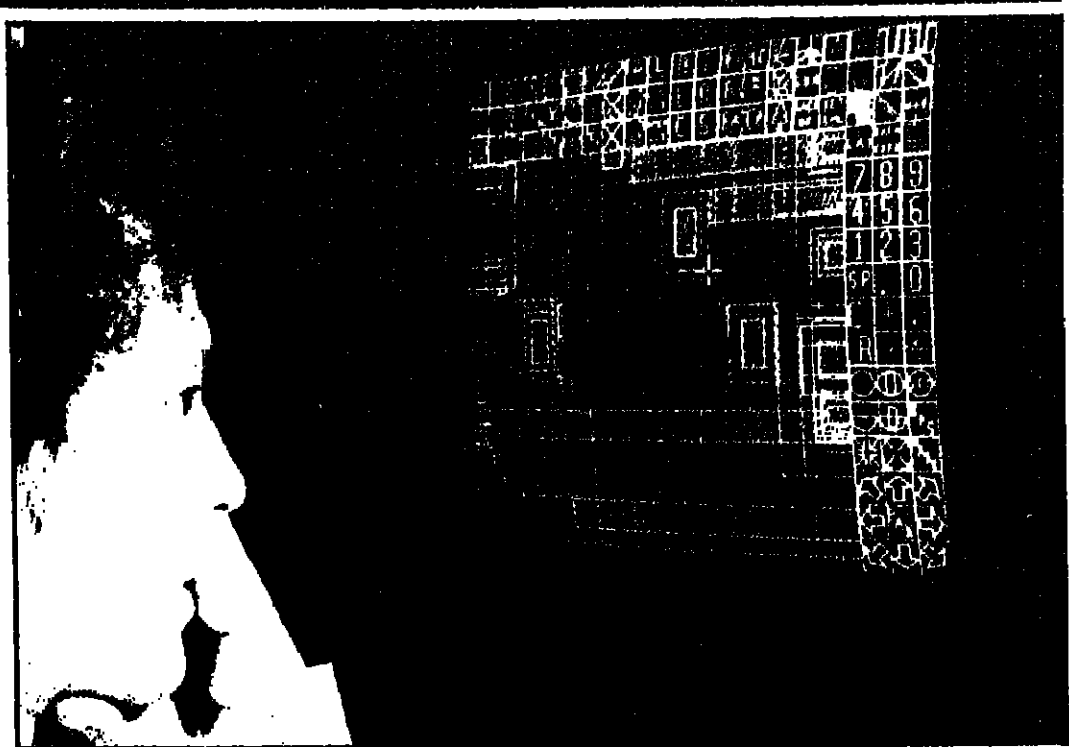
The second exception is more a bending of the rule than a breaking. In some applications the potential utilisation rate is so great that the system needed will be



**CAD is profligate with the use of a system's input/output capabilities**

input/output capabilities of a computer system.

Even if a CAD/CAM application can be run in a time-shared environment on a general purpose



Mainframe or supermini? ... The dedicated environment for CAD should be chosen very carefully.

both dedicated and time-sharing "general purpose" in nature.

Here the system is working in an analogous way to the general purpose time-sharing machine, managing databases, carrying out administrative work and also driving a variety of different design and/or manufacturing tasks. But it is in the end analysis still a dedicated system, as it will be unlikely ever to run a payroll program. Normally, such hardware environments can be assumed to be very big.

For a potential user to decide which horse is required it is first necessary to evaluate what type of course it is to be asked to work. These machines are typically targeted at specific CAD markets, and in particular the growing sector for the design of electronic circuits and circuit boards.

As the demand for custom and semi-custom, integrated circuits

risks, and as the design rules by which such devices are produced become generally understood outside the mystic world of the semiconductor industry, so it becomes easier for systems houses theoretically to design their own specialised circuits.

Using one of the new microcomputer CAD systems, these designers now have available the tools they need to perform such a task, or at least the major proportion of it.

In practice, the design of an electronic circuit is divided into two separate parts, each with specific design requirements. The first is the proving of the logic of the design to establish whether it will logically perform the functions required.

The second function in circuit design is the physical layout. Though a wide range of machines will be able to run the software

that ensures design rules have not been transgressed, only the most powerful and most specialised of the microcomputers will be able to run the attendant graphics facilities the design engineer will need.

It is only now that such systems are appearing on the market.

The demand made on both processor and memory by high resolution graphics in CAD has led to the predominant use of the supermini as the hardware system. These have sufficient power to provide the level of graphics support a circuit designer will require. In many cases they will offer a level of performance capability far greater than needed for circuit design work, but of a level that can effectively be exploited by other areas of CAD, particularly mechanical engineering and design.

Martin Banks is a freelance journalist.



### GINO-F

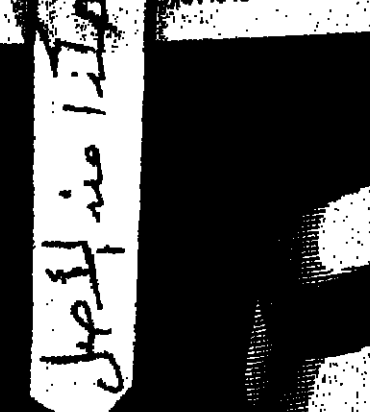
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Supplier	Mechanical	Electronics	Building	Total
Computervision	130	70	20	230(E)
Rascal-Redec	0	200	0	200(E)
Calma	15	75	0	100
Marconi Quest CAE	0	75	10	85(E)
Palco	50	0	22	72
Applicon	15	38	0	54
ARC	6	0	48	54
Prime (Compelec)	10	10	30	50(E)
Intergraph	18	4	28	50
IBM	40	0	10	50(E)
CIS	40	0	5	45(E)
Noctis Hill	33	0	7	40(E)
Shape Data	34	0	1	35
CAD Centre	30	0	0	30(E)
Radian	28	0	2	30
MCS (Anvil)	25	0	0	25(E)
Counting House	25	0	0	25(E)
Ferranti Cetec	19	0	0	19
McAuto	16	0	2	18
Garber	10	8	0	18

Catching up are GMWC with 15 systems sold, and Calcomp and Kongsberg with 12 systems sold each respectively.

(E=estimate)  
Source: CAD Source



# The computer system you choose rather depends on the life you wish to lead.

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# At the very heart of CAD

Andrew Thomas plots the growth of the Cambridge CAD Centre

THE managing director of a British CAD systems house might be expected to extol the virtues of UK expertise in CAD/CAM software; but when the president of the world's largest CAD company does the same, perhaps we should sit up and take notice.

"Damned good. Probably the best in the world," said Computervision president Jim Barrett 12 months ago when his company bought a sizeable chunk of that expertise in a takeover of Cambridge Interactive Systems (CIS).

And Computervision's greatest rival, Prime, snapped up another UK CAD company at about the same time when Stevenage software house Compeda became Prime Cadcam. Apart from being bought out by US giants, CIS and Compeda had one other thing in common: both were built around the products and expertise of one organisation - the Cambridge CAD Centre.

Compeda was set up by the National Research Development Corporation (NRDC) in 1977 to market CAD Centre products such as the plant design package PDMS, and CIS is a spin-off company started in the same year when four CAD Centre staff left to develop the Medusa solid modelling package.

Since then, other CAD Centre products have spawned new companies to market and develop them. GEMS of Cambridge came into being last April when 14 CAD Centre staff bought the GEMS image processing system from their former employers.

GEMS is still operating from the CAD Centre building pending a move to the Cambridge Science Park.

Subsequently Prosys Technology and Camgraph have both split off from the CAD Centre on their own, in process engineering and bespoke graphics work respectively.

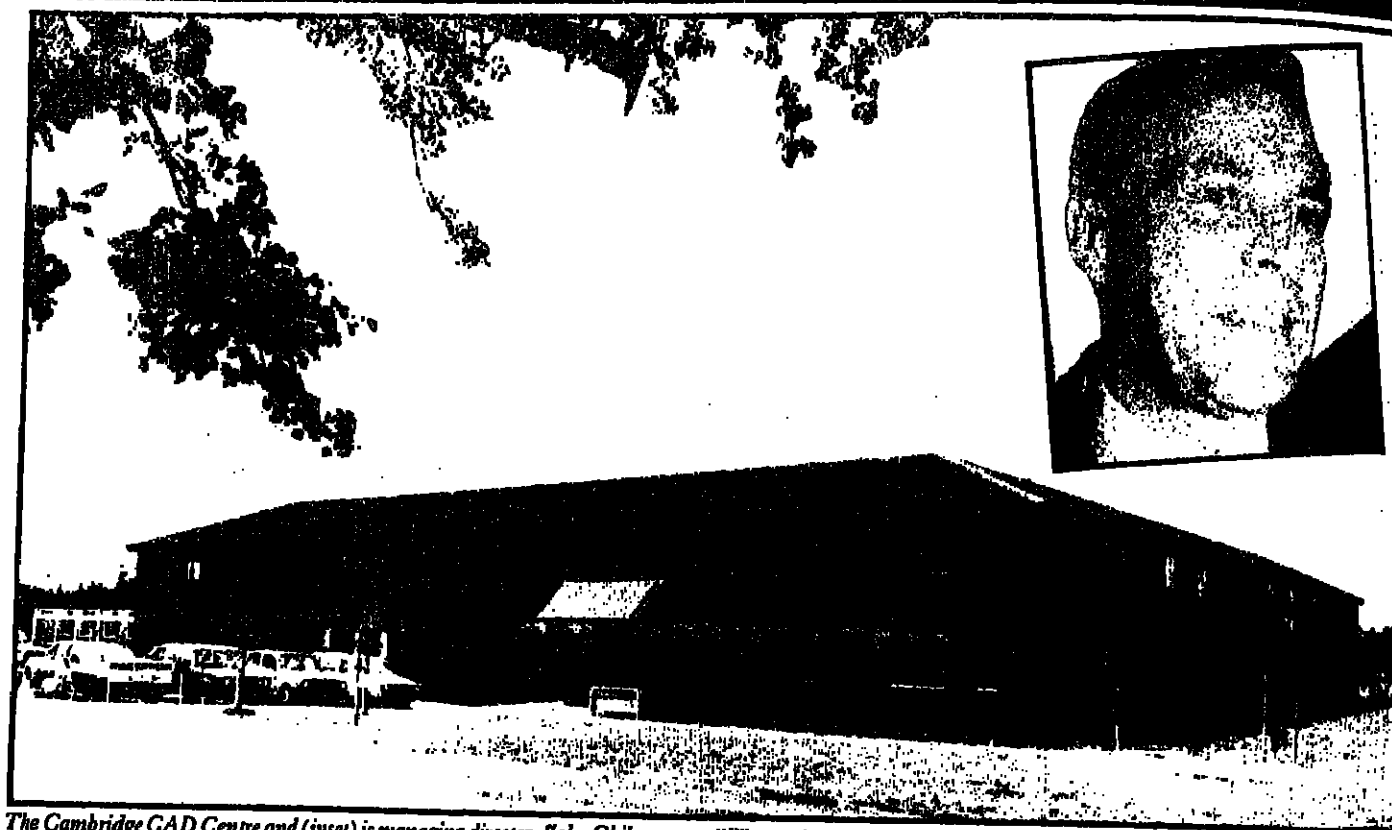
Since last June, the CAD Centre has been a private company in its own right, having been bought out by a consortium of ICL, engineering firm W. S. Atkins, engineering computer bureau SIA and two Cambridge colleges for £1 million.

What is now CADCentre Limited started life in 1969 as a research department of the Ministry of Technology, now the Department of Trade and Industry.

Along with an Atlas, ICL sold a facilities management deal to the Ministry under which both technicians and management of the Centre would be provided by the company newly formed by the merger of English Electric and ICT.

One of the first on site was John Chilvers, who stayed at the centre until 1977 when he became one of the four founders of Cambridge Interactive Systems (CIS). He is now back as managing director of CADCentre, while continuing as chairman of CIS.

"It was great fun in the early BERRETT. . . 'Damned good. Probably the best in the world.'"



The Cambridge CAD Centre and (inset) is managing director, John Chilvers. . . "We put the weeds in another garden."

post heap; we've put them in another garden."

In its early days, the CAD Centre carried out work in building and civil engineering in addition to plant and machinery design. But in the late 1970s these application groups were closed, their work being transferred to organisations such as the Construction Industry Computing Association in Dublin.

One of CADCentre's longest serving products is GINO-F, a two and three dimensional graphics package which was originally developed at Cambridge University and adopted by the newly-formed centre. Enhanced and rewritten in Fortran for portability, GINO has gone on to sell to more than 500 customers worldwide.

Now re-written once again, in Fortran 77, GINO has been given a new lease of life with implementations for the Sirius and Apricot micros and an IBM-PC version coming soon. There are already more than 50 users using micro versions, including a Research Machines eight-bit package starting at just £400.

The Centre's Atlas 2 on which GINO had been developed was phased out at the end of 1976 to be replaced by a wide selection of hardware including Prime, DEC, Apollo and ICL. As originally set up, the Centre operated as a bureau service providing both software and the computing facilities needed by customers.

With the departure of the Atlas, the emphasis changed to marketing versions of standard CADCentre products to run on the client's own machine.

This change from a bureau to a marketing operation led to the formation of Compeda in 1977. Set up in Stevenage, Compeda's original function was to act as a marketing front office for the b

out being downright rude. All this haggling is going on at the expense of the employees."

Enter US CAD giant Computervision with an undisclosed sum, reckoned to be in the £10 million bracket, in a bid to buy Compeda and its worldwide marketing rights to some of the best CAD software around.

IT Minister Kenneth Baker stepped in to stop the sale after Nottingham-based Isopipe, joint developers with the CADCentre of the PDMS plant design package,

after the takeover, being replaced by a caretaker managing director from Prime, David Cheesman.

In March Computervision bounced back on to the scene with the takeover of CADCentre spin-off company CIS in a deal involving a share swap giving the four founders of CIS a £50 million chunk of Computervision.

And to round off a perfect start to the year for the UK CAD industry, January saw the takeover of Quest Automation; Compeda's would-be partner, by a consortium of Arabs. By August Quest had called in the receiver, and in October Marconi Instruments put up £2 million to bring part of the company back into British hands when Quest CAE became Marconi Quest CAE.

Amid the doubt and uncertainty circulating in the British CAD industry, or at least what was left of it, the BTG announced that the CADCentre was next on the list for privatisation, setting on April 1 deadline for completion of the sale.

Again Prime showed an interest in snapping up yet more UK expertise, and, perhaps more importantly, the ownership of PDMS, denied to it in its takeover of Compeda. But this time Prime found itself up against a British consortium, led by ICL.

Deadlines came and went, and it looked as if negotiations were following the pattern set during the Compeda privatisation talks. It was during this period of uncertainty that GEMS, Prosys and Camgraph were set up by CADCentre staff, understandably anxious over their future employment prospects.

But despite the widely-held belief that the CADCentre would follow Compeda, CIS and Quest into foreign ownership, it was the ICL consortium which gained control of the centre in May, for a token £1 million, with up to £4.5 million payable over 10 years in royalties, depending on the new company's performance.

CADCentre Limited came into being in June, 1983.

In recognition of its interest in CADCentre products acquired with Compeda, Prime also has a seat on the board, as does, indirectly, Computervision. For managing director John Chilvers is chairman of CIS, and following its takeover by Computervision is a shareholder in the US company.

Chilvers believes Cambridge has already built up an identity as a centre of excellence in CAD/CAM, most of it stemming from CADCentre, as does sales and marketing manager Fred Chiles. "The UK is still the leader in CAD/CAM software. We talk to a lot of US companies and most have heard of us. They've all heard of Cambridge. A Cambridge address is important - if I set up my own CAD company it would be here. We're developing a Silicon Valley type reputation."

Continued on page 26

## UK kit sales gather speed

Market growth is now estimated at 35% . . . John Aczel analyses the prospects for this burgeoning sector

OVERALL sales of CAD/CAM equipment have been growing fast over the past 12 months, and the trend has gathered speed recently. The market size is still quite limited for this sector, though the prospects for expansion are enormous over the next few years.

Official statistics on CAD/CAM products are imprecise - not surprising in view of the difficulties in defining this equipment with any accuracy. For one thing, some of the hardware used in computer-aided design may consist of mainframe and minicomputers, which may also be used for general data processing purposes, and it is not clear how this type of equipment should be classified. Some of the CAD/CAM software is also difficult to identify from the official data and is not usually included in the statistics.

A fairly narrow definition of CAD/CAM equipment has been used in this survey - that the products are used exclusively for design and manufacturing purposes. Graphic terminals and plotters fall into this category, though any precise definition of these products is impossible at this stage.

There are no published statistics about the size of the market for CAD/CAM products, but according to some industrial sources sales are running at about £150 million on an annual basis. The growth of the market is estimated at over 35% at present.

Dr Paul Arthur, executive director of the CAD/CAM Association, believes products in this sector have achieved a very small penetration. According to his estimates, only 1% of industrial

locations in the UK are using CAD/CAM equipment in any significant way, and the main function of his association is to spread the gospel about the big advantages of these new techniques for improving the design and manufacture of a wide variety of industrial products.

Some information can be gleaned about the trend in demand for CAD/CAM equipment by analysing the latest trade figures, although it is believed the data is underestimating the size of imports by a wide margin. The classification used in the official data does not include some of the computer hardware which may be utilised for CAD/CAM applications.

Imports of major CAD/CAM products totalled £23.5 million in 1983 - more than double that reported in the previous year. Over the past few years, this sector has grown markedly and, by 1982, imports reached £10.8 million from a very low base in the late 1970s.

Most CAD/CAM equipment is being imported from the US and its sales have continued to dominate this field. American deliveries have more than doubled in value to £17.5 million in 1983 and represented about 75% of total imports by UK distributors.

In second place was West Germany, whose deliveries amounted to just over £3 million, representing 13% of the total.

Imports have also come from some other European countries and it appears that sales by Australian and Swiss manufacturers of CAD/CAM equipment have been on a rising trend. Sales by Swiss companies have jumped to

	1983	1982		1983	1982
	£000	£000		£000	£000
Australia	362	29	Australia	133	123
Austria	490	78	Bulgaria	448	461
Belgium			Canada	109	82
Luxembourg	47	20	Czechoslovakia	856	69
Denmark	73	79	Denmark	185	57
France	236	94	Finland	157	10
West Germany	3,128	3,175	France	188	25
Ireland	40	10	West Germany	908	71
Israel	36	14	Netherlands	963	72
Italy	500	424	Saudi Arabia	221	288
Japan	384	155	South Africa	362	29
Netherlands	32	16	Sweden	403	239
Norway	160	-	US	2,405	699
Sweden	52	6			
Switzerland	252	35			
US	17,482	6,640			

Table 1: British imports of major CAD/CAM equipment

	Value Index (June 1983 = 100)
1983	£000
June	2,012
July	1,439
August	1,588
September	1,900
October	3,466
November	2,135
December	2,121

Table 2: Trend in British imports of major CAD/CAM equipment (by value)

	Volume Index (June 1983 = 100)
1983	June
	July
	August
	September
	October
	November
	December

Table 3: Trend in British imports of major CAD/CAM equipment (by volume)

	Value Index (June 1983 = 100)
1983	£000
June	1,008
July	820
August	439
September	1,256
October	440
November	720
December	926

Table 4: Trend in British exports of major CAD/CAM equipment (by value)

	Volume Index (June 1983 = 100)
1983	June
	July
	August
	September
	October
	November
	December

Table 5: Trend in British exports of major CAD/CAM equipment (by volume)



A revolution is on the way in design and related fields.

Sterling has been fairly weak against the dollar over the past 12 months, making some of these imports more expensive, but this has not deterred higher deliveries of CAD/CAM products from the US. Many users have been willing to pay higher prices for products useful for their special needs.

The market for CAD/CAM pro-

ducts is still in its infancy and big strides are likely in this field over the next few years. For instance, in the US, CAD/CAM equipment is quite widespread and is utilised in a wide range of applications, and there is every reason to believe a similar trend will also take place in the UK over the coming few years.

Admittedly, it will take some

time for potential users to see the benefits of CAD/CAM techniques and, in many firms, it will result in altering design and production procedures quite dramatically.

The advantages of CAD/CAM can be far-reaching, and this will bring about a revolution in design in the medium term.

John Aczel is a freelance journalist.

## Which Computer is best for CAD/CAM?

**PRIME?**

**APOLLO?**

**DIGITAL?**

**DATA GENERAL?**

**HEWLETT PACKARD?**

**SPERRY?**

A vitally important question for anyone evaluating or operating a CAD/CAM system is which computer is best to power it?

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# There is life in the ghost factory

People won't be obsolete in future factories, says Steven Sonsino

THE day shift goes home and the assembly floor is closed. But the tooling section is still running — in the dark.

The plant has 29 cell-like workstations: seven are equipped with robots and the remainder have automatic pallet changers. The stations are served by unmanned vehicles, guided by the cells by electromagnetic rails and optical sensors.

The robots and pallet changers load materials from the vehicles on to the stations, and the vehicles move silently away. Finished parts are moved, again automatically, by other vehicles to another warehouse.

The only signs of man in this mechanical environment are the eyes, for high above each workstation is a video camera. One person sits in the control room: the caretaker.

Carefully, he checks the status of every busy cell in the factory, without leaving the shop floor, without even leaving his seat. Until the day shift returns.

This factory, constructed by Renault in Fuji, Japan, is just one example of the trend towards almost unmanned systems in night shifts. Manpower is still needed, however. By day, 19 workers fuss around machining stations, mainly for palletising, and there are 63 workers in the assembly section.

Japanese companies appear to be toying with local automated applications and moving on only when they are convinced of the potential cost-effectiveness of the systems. The major activities in the field of computer-aided manufacturing are aimed at the full development and implementation of computer-integrated manufacturing (CIM). This work was started in the late 1940s with the de-

velopment of numerical control.

The capabilities of small computers have increased as their prices have decreased. So, not surprisingly, their use in automation systems has also gone up. Some applications are still best left to large host machines, but more factories are providing applications suitable for mini and microcomputers.

Because of the dependence of work done at one site on work done at another, scattered computers are being linked together. Distributed processing in factory control is a growing trend.

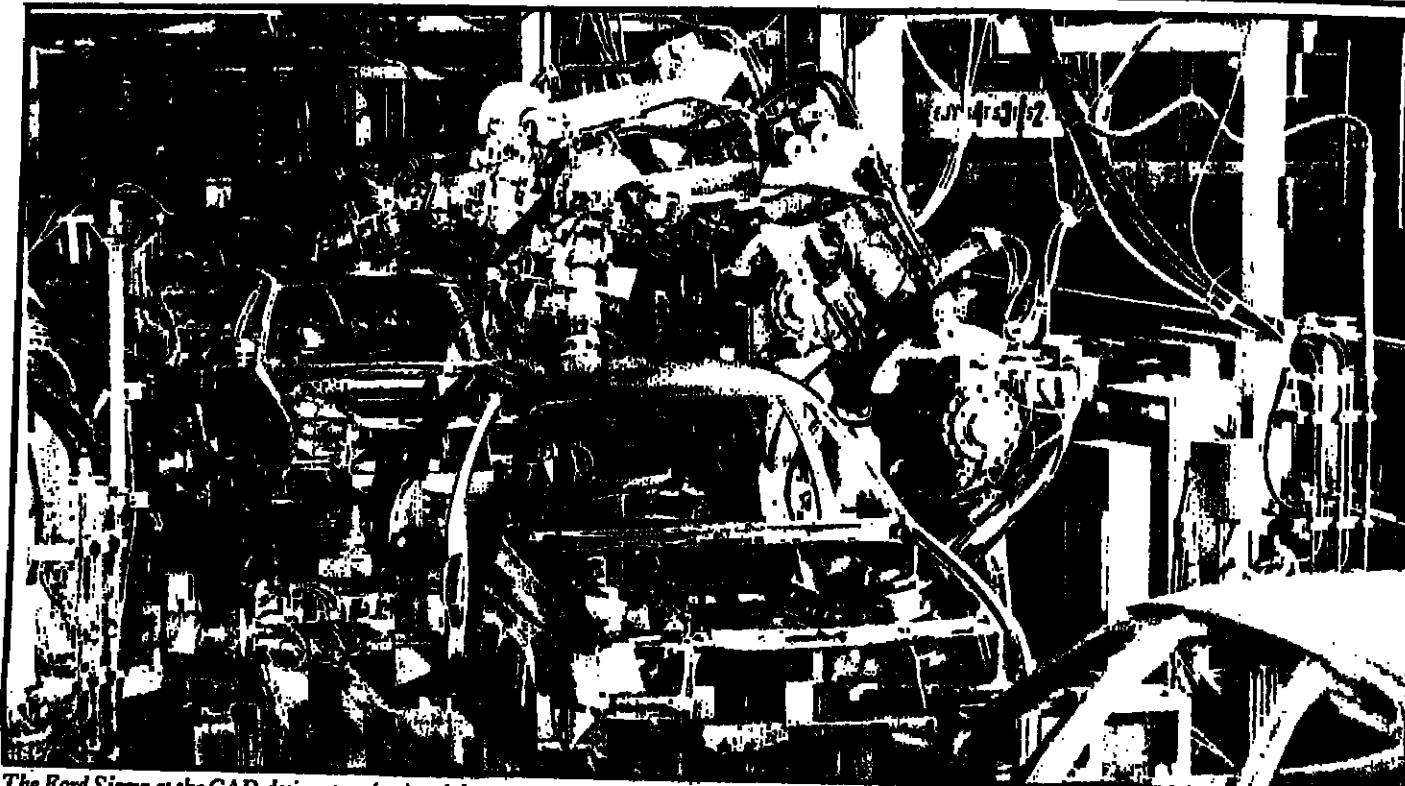
Computer-integrated manufacture will focus on three areas of heavy activity: flexible manufacturing systems, manufacturing software systems and computer-controlled industrial robots.

While most hardware for realising automated factories already exists, most of the necessary software does not. The rate of software development will therefore be the limiting factor in the race to the factory of the future.

Automation in mass production factories is considerable. The watch and car industries are typical examples. Only a few human workers are needed at assembly stations to feed materials into the automated production line. The assembly of engines, for example, has been streamlined by introducing robots that can transfer, position and fix parts automatically.

In March 1983, Austin Rover invested heavily in flexible manufacturing facilities to produce its Austin and MG Maestro. The term "flexible" really means that a range of hardware and software systems is available to choose from for the application.

To control production effectively, Austin installed a number of



The Ford Sierra at the CAD design stage (top) and the car in the CAM stage (below) made by robots made by people.

real time systems capable of making instant decisions on body and assembly building. The decisions were made according to which materials were available and also according to order priority.

The body and assembly systems were installed at Cowley, Oxfordshire, in phases and were required to co-exist with systems already operating. Some systems went live in 1983; some will be introduced this year.

The body and assembly projects differ significantly. The body systems represent high levels of automation, using robotics for example, while the assembly activities are an even mix of manual and computer-based systems.

Because of the differences between them, the body production systems interface computer systems to automated facilities, but assembly systems link the systems to people working in the plant.

Both systems make extensive use of light pens and bar code techniques for shop floor data capture. This technique has also been applied to Metro and Land-Rover plants.

Data capture units include Plessey light pen terminals and portable data capture units. In the assembly plant, a British-developed portable unit based on fibre optic technology from SB Electronics is used.

Economies were made in systems development by using existing software. This included proprietary packages, such as IBM's Copes and elements of Facsim from Intel (formerly BL Systems). Tracker, for example, tracks material movements in the body plant.

In addition, new systems were developed, among them Buscon, probably the most advanced system Austin Rover has installed. It was designed to handle the entire body-build function under computer control and is flexible in that it can expand to handle pro-

duction models other than the Maestro.

Intel, which provided the system, based its software on DEC PDP-11 computers, and its local communications systems were based on broadband cabling. This 2500m run of cabling, which accommodates all types of electronic signals, is unaffected by interference generated by machinery. It runs throughout the body and assembly plants and links terminals and computers for

system costs less than £20,000 and General Automation plans to capture the manufacturing industries that have been deterred from introducing computerised systems because of cost.

The starter package has been scaled down from the larger systems, and for a relatively modest sum manufacturers can buy and assess the system before investing heavily in any program. The company still provides £50-£100,000 systems and it is possible to upgrade factories from starter to more comprehensive systems.

The PMS starter package is based on a 16-bit microcomputer with 128 Kbytes memory and two 10 Mbyte Winchester drives from Jomega. These have adopted the Bernoulli principle, which means they can withstand more vibration than ordinary hard disc drives and can therefore be installed very close to production lines.

"Some companies try to make the factory fit the automation package," says Tony Bart, an industrial consultant with General Automation. "But we have a flexible range of shop floor developments which we can match to any equipment a manufacturer already has."

The controlling intelligence behind each system varies. Generally, however, three kinds of device are used on the shop floor, and these feed data to a remote mainframe.

First, controlling the workpiece is a programmable controller with a communications capability. Then there are data collection terminals dedicated to one machine or to a cluster. These machines send data to a microcomputer, which may feed larger control machines. The micro sends real time data in batch form from the distributed micros to a General Automation of IBM mainframe.

It is not yet economical to use robots in mechanical assembly jobs, but many engineers believe this situation is changing rapidly. Some companies have developed

prototype commercial systems for using robots in this way and it can only be a matter of time before the systems are free of problems and cheap enough for general use.

The main activities in industrial robotics are the developments of offline programming and high level languages for control hierarchy. Vision systems and applications software are also development areas.

A lot of research is being carried out into developing sight and touch for robots, because today's units are effectively blind. The workpieces must be in the right place for handling and oriented correctly, otherwise the robots will be baffled.

Hewlett-Packard has defined a four-tiered structure for a manufacturing company.

The first level of the structure emphasises control systems for the production process. These can be numeric control machines controlling lathes, drills or robots.

The second level describes supervisory processors, usually minicomputers, which control production and often store the software for the robots and numerical control machines.

The fourth tier of Hewlett-Packard's automation factory strategy includes corporate information processing systems. These combine the manufacturing functions with the management and administrative needs of a company.

Contrary to popular opinion, the factory of the future will be a labour intensive activity, says Lewis Brunecomb, vice-president and chief scientist to IBM. It will take a great many people to install and manage it.

People will design, manage and operate sophisticated computers, rather than serve as semi-skilled machine operators using the strength of their arms, he says. "This will provide the opportunity and the necessity for skills upgrading."

Steven Sonsino is features editor of Systems International.

People will design, manage and operate sophisticated computers rather than serving as semi-skilled machine operators using the strength of their arms

Data capture and management information.

The contributions made by the automation of Austin Rover's factories have enabled the group to implement a highly advanced facility without spending too much. The systems will operate within existing buildings.

A similar large factory system has been running for several years at certain Ford plants. The systems were installed by General Automation, which introduced an entry level package for factory automation at the end of 1983.

The production monitoring

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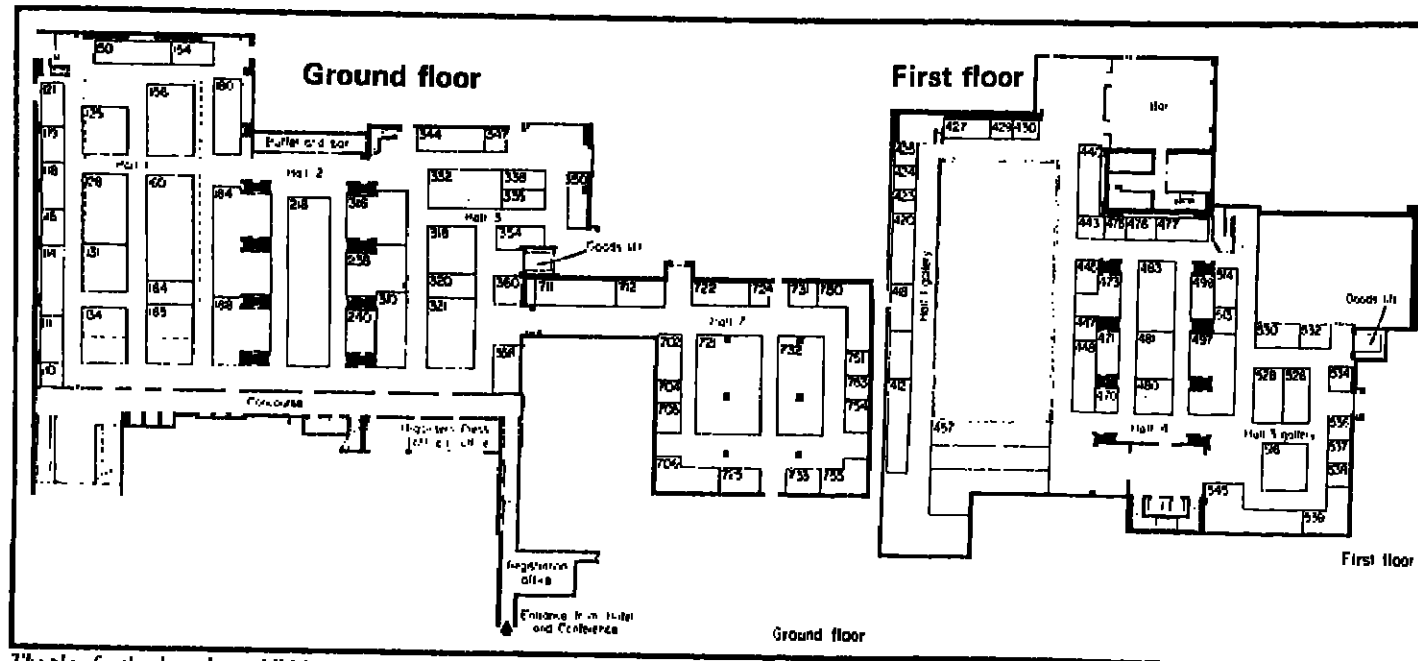
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The plan for the three-day exhibition, ground floor and first floor.

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THE sixth international conference and exhibition on computers in design engineering is next week at the Brighton Metropole in Sussex. Half as big again as CAD 82, the show will also see the first appearance of IBM - a measure of how important this annual event has become.

The exhibition is sponsored by the journal *Computer-Aided Design*, owned by Butterworth & Co (Publishers) Ltd and Reed Exhibitions is organising. Details: Sue Mitchell, conference secretary, Guildford 31261.

## List of exhibitors

### Ground floor

Stand no.	Company
110 Pragma	332 Calma
111 Sintrom Electronics	335 Jentech Services
114 Sigma	338 Scientific Calculations
118 Alper Systems	344 CEGB
119 Mitsubishi Electric	347 Engineering Materials and Design
121 Eclipse Associates	350 Apollo Computers
125 Westward Micro Systems	354 AM ADMEL
128 Applied Research of Cambridge	358 Pafec
131 Calcomp	360 Butterworth Scientific
134 Data General	702 Dicommed
150 Benson Electronics	
154 Whescoe	
156 Tektronix	
160 McAuto	
165 Counting House Computers	
180 CAD Centre	
184 Prime Computer	
188 Ferranti Cetec	

218 Digital Equipment	705 Aworth Land Surveys
238 Shape Data	711 Daisy Systems
240 Terminal Display Systems	712 Munpower Services Commission
310 CIS Products	721 IBM (UK)
316 Norrie Hill	722 Lexidata
318 Gould SBL	724 Draughting and Design
320 Personal CAD Systems	725 Surveying and Scientific Instruments
321 Intergraph	731 Computer and Design Services
	732 Marconi Quest CAE
	733/755 Vector General
	750 Intec Equipment
	751 Computational Mechanics
	754 Marconi Electronic Devices

### First floor

Stand no.	Company
412 Department of Trade and Industry	475 Finite Element Analysis
418 Intertrade Scientific	476 AMK Berlin (Camp '84)
420 BCD Systems	477 Mentor Graphics
423 CICA	480 Ambitron
424 Autodesk	481 ICL
425 Mountford and Laxon	483 Micro Aided Engineering
427 Cascade Graphics	497 Rotring
429 Publishers' Literature Stand	
430 Primagraphics	499 CAD/CAM International
440 National Engineering Laboratory	514 Keen Computers
443 Staedtler	516 Versatec Electronics
445 Wayne Kerr Datum	526 Genisco
447 Shiremoor Professional Systems	528 Radan
	532 Auto-trol Technology
	534 Deltacam
	536 Technology
	537 Elsevier Science Publishers
	538 Quaretech Design and Development
	539 Aarque Systems
	545 Engineering Computer Services
448 Techex	
457 Control Data	
470 Integrated Vision Systems	
471 BDP Computing	
473 Imalc	

## The heart of CAD

From page 22

Chilvers maintains that the changes in ownership have had little effect on the state of the UK industry.

"The CAD/CAM industry has not changed much in the last four years. It's caused lots of comment, most of it concerning ownership. And it was an unhappy accident that Compendia, CIS and Quest all happened simultaneously - it looked like a landslide."

"The fact that CIS is now owned by Computervision is immaterial. They've left it very much alone - it's a people business. The day when CIS is absorbed by Computervision is a long way away."

"It won't be long before it's difficult to sell isolated CAD/CAM systems. In marketing terms you don't succeed unless you're dealing in world terms - the US. The BEC does nothing to help and the UK does less."

"The UK government takes five competing companies, puts them together, then lets the winner attack the US giants."

"We can't become another Computervision, just chasing someone else's tail. What you'll see is a limited number of products attacking a very limited number of areas. There are some geographical areas where the major companies have little penetration because it's too small an area to bother with."

"The large US companies see America as half the world and Europe as the other half - and monolithic at that. They don't realise that Belgium's two countries, for example."

"Nine months after its birth, CADCentre has a new image and a new direction."

Chilvers explains: "The difference is that we're now more commercially than research oriented. When we were a government department it wasn't always a good idea to make money. For example, we could have sold a Vax along with one of our packages and made 7% of its price, but the government wouldn't let us."

"Now we'd sell a bus if we could make money on it."

## STANDARDS

# Setting standards that count

Brian Meek continues his occasional series on standards, this week telling the tale of the interface gap

MY memory was recently cast back a number of years more than I care to compute. It was to a time when computing had not lost its freshness, Algol 68 was a bright new star in the sky, and hope was still something more than a four-letter word. I decided I would like to connect a teleprinter to a minicomputer for which I was responsible.

You might say I wanted to try out this new-fangled idea of interactive computing - except that in my case it was more a question of nostalgia for the primitive days more than a decade earlier. Then I had sat for hours on end, single-shotting machine-code programs at the console of an IBM 650, feeling in front of all those lights and switches like an airline pilot on one-hundredth pay.

In those days interaction was taken for granted; the aim was to make everything automatic. Later

is and start turning into electromagnetic energy lurking in bits of wire or semiconductor, I'm lost. With any hardware, I look for idiot-proof simplicity.

Take kitchen equipment: when I buy an electric pancake stuffer or spaghetti straightener, I expect to be able to plug it in, switch it on and use it without trouble or fuss. I hope for a kitemark to assure me it is safe, reliable and efficient. I want to be sure there will be no interface problems with a pancake topper or spaghetti sauce mixer of different manufacture.

The point is that, even after all these years, this kind of situation still does not obtain in the computing field. It is rather better than it was; but the "standards" we have are still not standard enough - they leave too much room for variation. RS232C (or V24 as it is used to be called) is all very well as far as it goes, but it does not go far enough.

What I want to do - and I am sure there are many like me - is to buy two pieces of equipment and know for sure that I can plug them together, and that they will work. Tapes, floppy discs and so on are other examples.

I am sure the manufacturers would say it is all very well to standardise simple interfaces like mains plugs into power sockets or bulbs into lighting sockets, but computer interfaces are much more complicated. Of course they are: which is precisely the reason why standardisation of them is so important.

Too many manufacturers are obsessed with the aims of locking customers into their own products, or denying the opposition a short-term competitive edge. Yet, as Ray O'Connor pointed out in the National Computer Users' Forum last July, the effect of agreement on standards is to increase trade for everyone, often dramatically.

It is a pleasure to report that someone is trying to tackle at least the RS232C problem. At the IFIP Congress in September I went to an invited lecture by Professor Nicoud of Lausanne. My heart

I want to be sure there will be no interface problems with a pancake topper of different manufacture

warmed to him immediately when he said he had been asked to talk about microprocessors, but had instead insisted on talking about standards.

Here was a kindred spirit! I commend his paper (pages 375-381 of the participants' edition of the proceedings) for anyone interested in microprocessor standards.

More to the immediate point, one of the things Nicoud talked about was a proposal under discussion in an IEEE sub-group for a new serial standard: "More efficient and user-friendly than the widely used, but inadequate, RS-232C... specially interesting for keyboards, mice, tablets, and other low-cost but powerful peripherals, which must be electrically powered by the data cable or must have better performance", to quote the handout. The point leaders of the project were (then) Professor Nicoud and Matt Blower of Pro-Log in Monterey.

This seemed to me then, and still does now, a project of major importance, yet one which so far seems to have had shamefully little support. Regrettably, Nicoud has recently had to drop out of this project because of pressure of work. This makes it all the more important for others to come in and keep up the momentum.



"With any hardware, I look for idiot-proof simplicity."

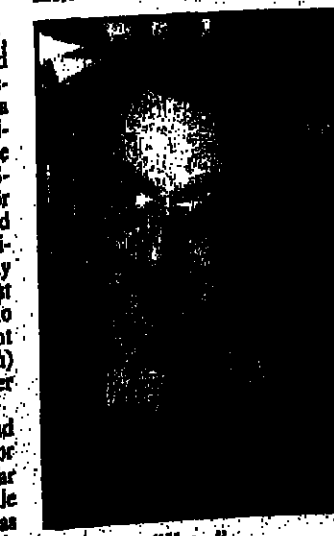
The number of people who would benefit from its success can be measured in millions.

The IEEE project is denoted "P-1011 serial transfer line", for those who want to follow it up. (There is also a related project in the journal *Microprocessing and Microprogramming*, pages 243-247.) I hope those who are technically able to help develop such a standard will do so.

Even if you are just a user, like me, but have suffered from the inadequacies of existing standards and feel the need for something better, it is still worthwhile to write in to express that need. Users suffer from lack of organisation and co-ordination; they have not got their act together the way the manufacturers have.

Yet collectively we have a lot of power - to write standards requirements into procurements, to demand standards which do not yet exist. I believe it is up to us to say that we want things like IEEE P-1011, and to keep on saying it until they appear.

So don't just suffer and grumble and cope the best you can - let your voice be heard. Matt Blower's address is: Pro-Log Corporation, 2411 Garden Road, Monterey, California 93940.



Brian Meek is director of the Computer Unit at Queen Elizabeth College, University of London.

## The key to computing power

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If you feel there isn't anything you don't know about the DEC and DEC Compatible market we suggest you turn the page.

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## INSURANCE

Providers of computer services can now be covered against liability for poor performance, says David Blackburn

# A policy against system faults

ONE matter not always considered is the significant capability of inadequate or faulty computer systems to do damage to commercial organisations. Consider the case of a medium-size taxi firm which decided to computerise its booking and accounting operations and invest in a system where five terminals were to be linked by the public telephone system.

The system appeared to work adequately but the consultant had omitted to advise about the consequence of the increase in telephone charges resulting from the use of the telephone system. As a result, the taxi firm could not afford to use the system and as the old administrative system had been terminated, the firm went bankrupt.

The consultant, which was a small computing firm with limited resources and no insurance cover, could not afford to put things right. If it had had errors and omissions insurance, a successful claim may well have been made following proof of negligence.

This may seem an unusual set of circumstances, but the insurance industry continually sees and has to cope with the consequences of errors mistakes, mutual misunderstandings and sets of circumstances which "never" occur.

The term "errors and omissions" has been used in preference to professional indemnity as the latter is often associated with the older professions, such as architects, accountants or lawyers. Perhaps errors and omissions insurance is a more understandable term, but it does not alter the basic principle behind the cover in that it protects the provider of the service, on which other people have relied, against his legal liability for not having performed adequately.

Errors and omissions insurance would, in the case of the taxi firm, cover financial loss suffered where there is no damage to property or injury to persons.

It is important to note that the policy not only covers claims for damages, but also provides for legal defence costs where there are claims, allegations of negligence, or related disputes. The knowledge that legal advice is available if a dispute arises is a valuable service as the assured can rely on having experienced persons dealing with the problem.

Legal expenses insurance is in many ways the reverse of errors and omissions cover as it enables the provider of the service to prosecute actions, though it is important to see that the cover dovetails with that given under the errors and omissions policy.

With the increasing sale of software packages, suppliers may invest many thousands of pounds in the development of a product only to find that it is being copied, and in the case of a successful product, being passed off as the original.

Copyright normally rests with the writer of the software, and the trend is for suppliers to resort to legal actions to protect their market position. The law on copyright

relating to computer software does require clarification and there is pressure for amendments to be made to the Copyright Act. If the supplier has licensed software, there may be disputes over the terms of the licence or other disputes with third parties of a contractual nature.

One of the difficulties of providing insurance for the computing industry is the mixture of products, computers (including printers and other peripheral devices), software and software packages.

Packages are often sold as products but as they incorporate intellectual thought they cannot be treated in the same way. Unlike a washing machine, which you can physically examine for suitability, software often needs to be run by the user to establish whether it is suitable.

With the enormous diversity of products available (there are about 150 different makes of small business computers on the market) and software, it is not surprising that significant problems arise.

The industry is fiercely competitive and a computer or

**The insurance industry continually has to cope with the consequences of errors, mistakes, mutual misunderstandings and sets of circumstances which "never" occur**

item of software which is suitable for one application may not be suitable for another.

This is often aggravated by deficient contracting procedures. Where supplier and customer prepare contracts defining their relative responsibilities and obligations, it helps to iron out problems before they occur.

Pitfalls are:

- The needs of a client may be misunderstood.
- There may be errors in the software, maybe not performing to the specification requested.
- The customer has to rely on a supplier's expertise as to whether a software package is suitable for a particular purpose.
- The customer has to rely on a supplier's expertise as to whether a particular piece of equipment will provide the performance required.
- It is likely that there is nothing wrong with the equipment, it is just that it is not right for the particular circumstances.
- Computing firms have access to large amounts of confidential commercial information which may be inadvertently, or negligently, released to third parties.
- Employees of the computing firm could use their knowledge of a client's system to defraud the client or maliciously interfere with his business.
- An employee could dishonestly

misrepresent the performance of a piece of software in order to obtain an order.

■ The supplier may be involved in a dispute over copyright, and a customer who is using the disputed software may have his business disrupted because the action prevents him from continuing to operate it.

The main risk for legal expenses insurance involves potential prosecution costs over copyright or trademark disputes, bearing in mind that defence costs are normally covered by an errors and omissions policy. The whole range of contract disputes cannot be ignored, as a computing firm will rely on other professionals for services such as an accountant or

insurance broker.

Additionally, within the past year, the insurance market has in the area of computing seen a number of potential claims where the loss figure substantially exceeds £100,000. Not only are these claims being made against firms specialising in providing computing systems, but also against accountants and other professions which now give computing advice as an extension of their traditional work.

The most common cause of claim is the failure of the computer system to perform in accordance with the specification. This could, for instance, involve incorrect functional specifications, inadequate hardware or the inability of

the software to process the correct volumes of data.

As people become used to computers, they will have a much clearer idea of what they want. This should lead to improved standards of contracting where responsibilities and obligations are more clearly defined.

As there is a trend for firms to specialise in certain sectors of the economy and as such firms become more expert, higher standards will be expected by their customers. One factor, however, which can prevent a customer from bringing action against the supplier is that when a computer system is being installed, the supplier becomes heavily involved in the day-to-day activity of the business.

It is therefore simpler to come to an agreement with the supplier rather than asking him to leave and appoint another firm. The new firm will have to start from the beginning, learning about the way the customer operates, thus increasing the cost beyond that which could have been obtained had negotiations continued with the original supplier.

This makes errors and omissions policies difficult to settle, not only as to who is responsible but also for the amount of loss.

The loss could be in the form of projected benefits foregone and increased costs in the short-term.

David Blackburn is a director of Bowring Professional Indemnity.

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# TANTUS



# Spare the programmer — and share blame for these errors

Mistakes and problem-solving are the latest topics to be examined in our Thoughts on Project Management series

IF there is one thing worse than making a mistake, it is making a mistake which is discovered by someone else.

One of my early computing jobs was to help set up a model of a power station control system on an analogue computer. After we had set up the model on the computer and performed the initial checks, the design engineers were called in to watch the system run so that they could optimise some of the parameters in the design.

We worked steadily through the day until late afternoon, when one of the engineers said some of the results were not showing what had been expected. We went through all the usual steps of checking the theory, the logic of the model and the test results.

Eventually, in the late evening, we discovered that the problem was an obscure error a colleague had made.

Next day we went to explain to our boss that the previous day's computing had been wasted, due to an error by a member of the team. We all felt sorry about the mistake (most of us felt fairly sorry; the one who made the mistake felt really sorry).

We offered the boss our explanations, then discussed what went wrong and how it could be avoided.

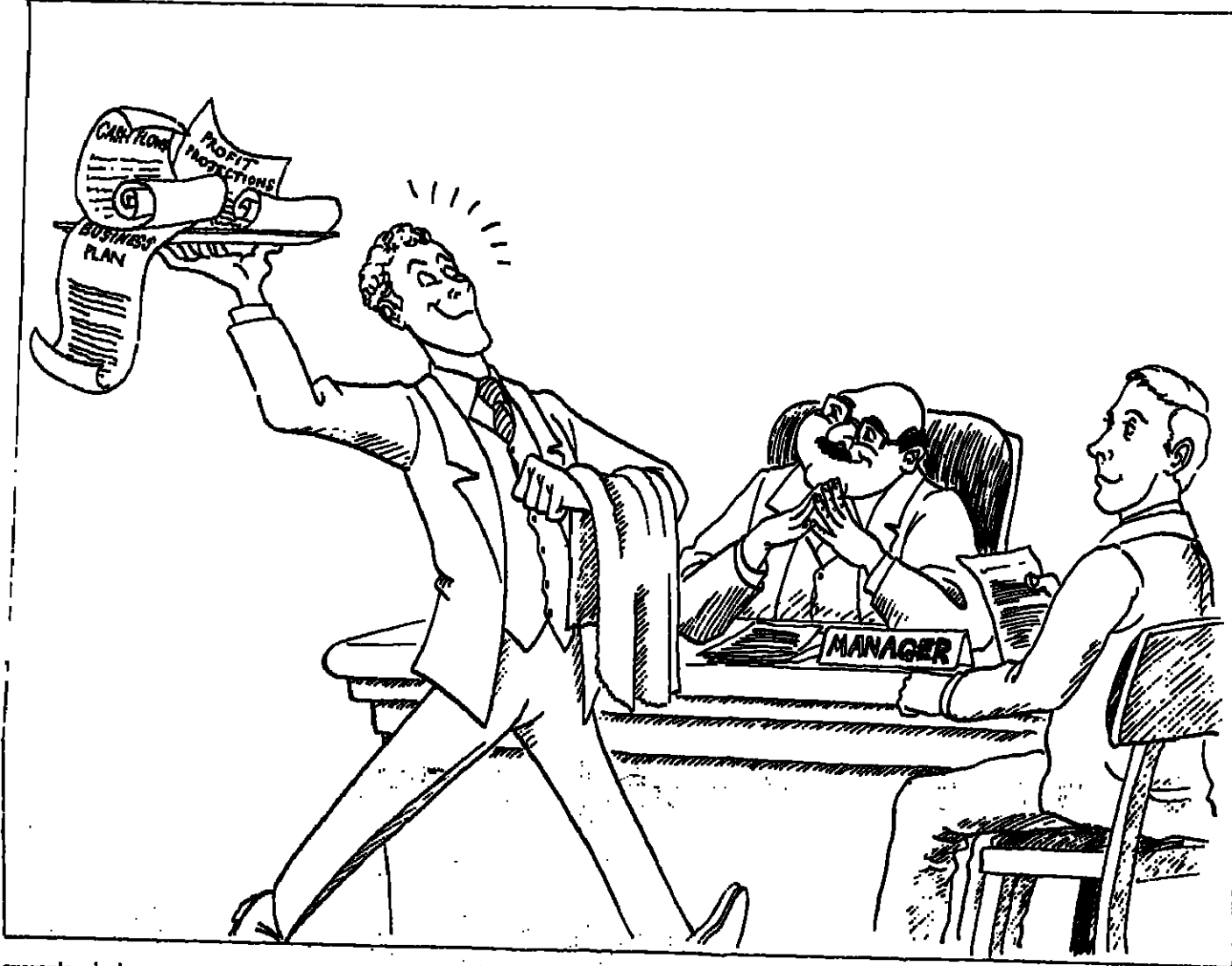
He cheered us up by remarking philosophically that the only people who don't make mistakes are those who don't do anything.

There are three activities which the project manager or his staff are involved with, and which are therefore fertile areas for mistakes. These are programming, design and management.

I should like to show how mistakes in each of these areas show up in a different way.

While we have all heard of bugs that have lurked in software for years, before being discovered at the most inconvenient time imaginable, most errors by programmers are soon apparent. Often these are easy to find and correct, but sometimes they are as elusive as the Scarlet Pimpernel and as difficult to correct as Al Capone.

In many circumstances, for



example during system testing, programmers are put under a lot of pressure when correcting errors. Unlike people involved in management, they have their work checked in minute detail by an unforgiving computer.

The project manager needs to be aware of this stress on his staff, while at the same time using it as useful motivational aid.

As well as the programmer, the user also works at a detailed level. His mistakes are shown up with equal promptness by the helpful computer. Good data validation procedures can help minimise the chances of mistakes occurring, but

it is the project manager's responsibility to ensure that a program is thoroughly tested before it goes into production. It is the user's and the systems analyst's job to ensure that test data is thorough and representative. So any error in a production system is a shared responsibility.

As well as the programmer, the user also works at a detailed level. His mistakes are shown up with equal promptness by the helpful computer. Good data validation procedures can help minimise the chances of mistakes occurring, but

there will be occasions when an error slips through, with serious consequences for the user.

Just how serious is illustrated by the fact that at one time I worked at a bureau where we ran large engineering calculations. A client made a mistake on his input data, with the result that he not only wasted many pounds' worth of machine time, but also nearly lost his job.

At the system design level, mistakes are not as immediately apparent. In a typical project there

will be a gap of some months between completion of the design and implementation of the system. Some design errors may not show up until the planned volumes have been built up, perhaps years after the system initially goes live.

The delay between the mistake and its effects means it is especially important for the systems designer to have a professional approach to his work. He should not just cobble together a system so that it works until he has moved to his next project. Instead he should have responsibility and maturity to

ensure that his design meets the full design criteria.

While the obvious way of avoiding system design mistakes is to employ good system designers, there should be a procedure by which the design can be reviewed. This could involve the project manager and other members of his team, or he could ask for an outsider to look over the design.

Mistakes by the project manager can also be long term in effect. For example, if he employs the wrong staff, the result may last until the (extended) end of the project, or even beyond.

As well as keeping an eagle eye open for other people's mistakes, the project manager must also guard against his own. He can do this by giving himself time to think clearly through any problem. If he is not sure about any decision, he should seek a second opinion from someone whose views he respects.

It is an interesting phenomenon that the more detailed the work, the more surely the mistake can be seen, and the mark of guilt assigned. The more one moves from the detailed level, the more the issues become blurred and the more scope there is to cloud the issue, and any that the mistake wasn't a mistake at all. Indeed, the enthusiastic backside protector will spend much of his time explaining that decisions he made were perfectly reasonable at the time — only unpredictably changing circumstances thwarted him.

While it is understandable (and often the right thing to do) for the project manager to justify his decisions to others as being correct, it is important that he should be honest with himself. If he does make a mistake and get away with it, he should go beyond self-congratulation and learn how he could have avoided the mistake in the first place.

The good project manager should recognise that everyone — including even himself — will make mistakes occasionally. It is his job, by good management and procedures to ensure that the number of mistakes is kept to a minimum, that their effects are minimised, and that they are all discovered and corrected before the project is completed.

## WORKING IN SAUDI ARABIA

The Saudis have started to shop around for staff, says Richard James, who spent some time in the country

# Arab money is drying up

WORKING in Saudi Arabia is not as profitable as it once was. The contracts have become less lucrative, thanks in part to the low price that oil is now fetching, but there has also been a realisation within the country that foreigners can be hired for smaller and smaller incentives.

When new labour is required, the Saudis shop around — something they were not capable of doing in the early days. Many Moslem countries supply cheap manual labour, but countries such as the Philippines increasingly supply personnel for such jobs as programmers, analysts and operators.

The diverse population in Saudi Arabia only hinders the problems of personnel selection, as different nationalities are offered contracts that differ considerably, especially for things like holidays and flights home.

The normal equation for working out salaries seems to be to take the average pay for the country of origin, and multiply it by three.

**It is not unknown for deductions to be made from an offender's salary for a minor infringement of company rules**

This means that people originating from Europe and North America are more expensive to employ than those from India, for example. The Saudi Arabian ministries in particular are well aware of this, having had their funds slashed for the second year running.

Certain ministry employees have seen many changes in the last two years relating to incentives and contracts. Labour laws which apply to all companies within the kingdom do not apply and cannot be enforced on any ministry. As a consequence, employees can and do have their contracts changed, and always they are worse off.

As an example, take the case of a computer department, where it was decreed that "Money will no longer be paid to employees who work overtime on Fridays (the one day normally not worked). Instead, these days may be taken as holidays, but they must be taken within the Kingdom".

Since the majority of people can find insufficient activities to keep themselves occupied during normal free time, they certainly do not want these days within Saudi Arabia. They would not mind working them if these days could be tagged on to their meagre holiday entitlement of 30 days (Fridays included in this total), plus four or five days at the two religious holidays.

However, the rule remains. (One member of the above computer operations department was so disgruntled with changes in his benefits that he took his company car to court. Not only had yearly increases been halted, but this man, and others, were forced to pay back all such increases previously received.)

Over three years, these had totalled about £10,000. After many frustrating months of legal proceedings, the action was finally thrown out because the court had no jurisdiction over ministry affairs.

Appeals to the minister came to nothing, and the man resigned at the end of his contract of course. Another ministry rule does not allow people to resign before the end of their contracts.

A problem that British employees of Saudi companies must face is that of working for Saudi nationals, who in many cases have little experience.

At times, they can be overbearing, insisting sometimes on the most arbitrary actions being carried out. The punishment system is well established, and it is not unknown for deductions to be made from an offender's salary for a minor infringement of company rules.

When it comes to having personnel problems sorted out, again the Brit is at a great disadvantage. Language difficulties often get in the way; but also, if you happen to arrive at an office at a bad time, you are unlikely to get anything done.

You will most probably be told to come back tomorrow: "Perhaps it will be ready then", which is normally followed by "Inshallah." This last word means God willing, and usually is the prelude to more frustration.

Conditions of work vary greatly, and it is difficult to put them all in one bag. Generally, Western companies are the best providers of accommodation and perks. Living on a compound can be much better than a holiday camp, where all sorts of leisure and recreational facilities are provided, including swimming pools and well furnished apartments or villas.

Compare this with the Camp, which is where a lot of contractors are housed. These camps are usually some way from the workplace, and the facilities are often described as poor. Often one hears of squash courts with no light fittings, or swimming pools which get cleaned out once or twice a year.

There is a third class of employees, who does not get put up in a compound, nor have to put up with a camp. He is the semi-independent, possibly working for a ministry, who gets a housing allowance and then must find somewhere to live.

If he gets an apartment, and lives alone, he is likely to use up all his housing allowance and a good bit more.

The government in Saudi Arabia has been forced to cut back on many projects, and many budgets have been slashed, but towns are still visibly growing: places like Jubail and Riyadh are expanding at a steady rate, and it seems that the need for foreign expertise is almost a permanent feature of the country.

For those who enjoy living on a building site, one of the expanding communities is the place to be, with the added convenience of wearing summer clothes almost the whole year round.

If you have to drive, then your vocabulary will definitely increase as you learn to return in several languages. It takes about a good 12 months to adjust to the lurid driving, but that is another story.

At the end of the month apportioned, and people begin to search the night sky for the new moon which will herald the new begins month, thoughts turn to salary, and payday. At that time and on that day, everything seems

to be worthwhile. You go to the appointed place. You wait your 45 minutes while one Saudi checks names and passes your ID card to his partner, who, having located your envelope, hands out the cash, while retaining the envelope for future use.

As you stand and count your money, and allow yourself the luxury of a little daydream, you can forget about the hassle and the problems of being in a strange country. The money was what you came for, and at least that comes with regularity, every four weeks... inshallah.



"The added convenience of having summer all the year round."

## Country Computers — The Inside Story

The C3000 series microcomputer, including 20MB Winchester disc drive, plus FREE Qume VDU.

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Country Computers Limited

Country Computers Limited, Pipers Road, Park Farm Industrial Estate, Redditch, Wore. B96 0HU. Tel: 0527 28626. Telex: 337 487 Finex G.C.C. Ltd. — members of Specialist Computer Ltd.

Please send me details on the C3000 series. ☐ Dealer enquiry ☐ Position ☐

End user enquiry ☐ Demonstration required ☐

Name  Company  Address

# Solve that problem — before others spot it!

PROBLEMS — sometimes known as challenges, opportunities or solutions in disguise — add interest to the project manager's life.

This does not mean that to be fun a project has to be riddled with obvious troubles. Far from it. For a project to run smoothly, the project manager will have to foresee many of the problems and solve them in advance, before they become apparent to others.

The problems the project manager will have to deal with range from the well defined technical problem (which he should probably get someone else to solve), to the more nebulous area of human relationships.

Similarly, the time the project manager and his team have to solve problems will vary from the relatively long time allowed to solve design problems to the very short time allowed to re-schedule work, if there is an emergency, such as the computer becoming unavailable.

Before he can solve a problem, the project manager must recog-

nise that there is a problem to solve. This may appear obvious, but I believe it implies one of the most important abilities a project manager should have — the ability to think of problems that could lie ahead, not with a view to throwing up his hands in horror, but with a view to taking action to avoid the problems, or to have contingency plans, in case they should occur.

To be able to foresee these problems and take the necessary action, the project manager needs time as well as ability. He must discipline himself to take a long view of the project and not get too involved with the day-to-day work at the expense of this.

I have seen project managers who constantly fight to overcome urgent problems, sometimes with success. I believe that in such cases they would have been even more successful (if less heroic) had they thought in advance.

While the most important reason for thinking ahead is that it gives the project manager a better chance of solving problems, there

is another reason why he should do this. This is that both his senior management and the ultimate users of the system he is developing are involved in the project. They have to make their plans work with those of the project manager.

His boss may have to provide staff or other resources. The users

will be planning their part in providing test data, or in the training and implementation phase. None of these people want his plans upset. But if there is a problem which affects them they want to be told as soon as possible when they may be able to do something to lessen the effect, rather than at the last minute when it is

too late.

Having identified a problem, the project manager may feel that the only realistic thing to do is panic. This is rarely necessary. It is most unlikely to be an insurmountable problem, which will cause the project to fail. If it is a serious problem it may affect the time or money spent on the project.

Similarly, he must use his common sense and knowledge of the importance of each problem to decide how much time he should spend solving it. There is no point spending hours considering a trivial issue when a wrong answer makes little difference. In these cases it is generally better to decide something — anything — and get on with more important matters.

Before any significant problem can be solved, the relevant facts must be gathered. This will involve the project manager, or other person solving the problem, making sure he has the right questions of both himself and of others. By digging into the background and understanding the essential nature of a problem, a

solution often presents itself. The information gathering, analysis and solution development phases of problem solving often merge into one.

This is not surprising as much of the information gathering will be a two-way process, where the project manager will be asking questions and exchanging ideas.

A two-way exchange of information can be a most important part of problem-solving. It enables the project manager to involve the intelligence of the people who are most affected and who are therefore most motivated to see that the problem is solved satisfactorily.

In the words of the old saying, a problem shared is a problem halved. While sharing a problem may well help the project manager to find an answer, it does not in any way diminish his responsibility. It is up to the project manager to ensure that problems are solved and that the appropriate courses of action are taken.

Pragmatist



## PRODUCTS

# Dual-purpose electronic typewriter

COMMUNICATOR II, a dual-purpose electronic typewriter and RO printer from Infrascopie, is based on the Smith Corona EC 1100 and EC 1300.

It incorporates an RS232C compatible interface and is capable of being linked to almost any microcomputer.

The interface has been designed by Infrascopie and is the only one approved by Smith Corona for the EC 1100 and EC 1300 electronic typewriters. This allows Communicator II to be used as a standard electronic typewriter.

As an electronic typewriter it has a memory correction facility allowing any or all of the last 46 characters to be removed automatically. There are no problems with

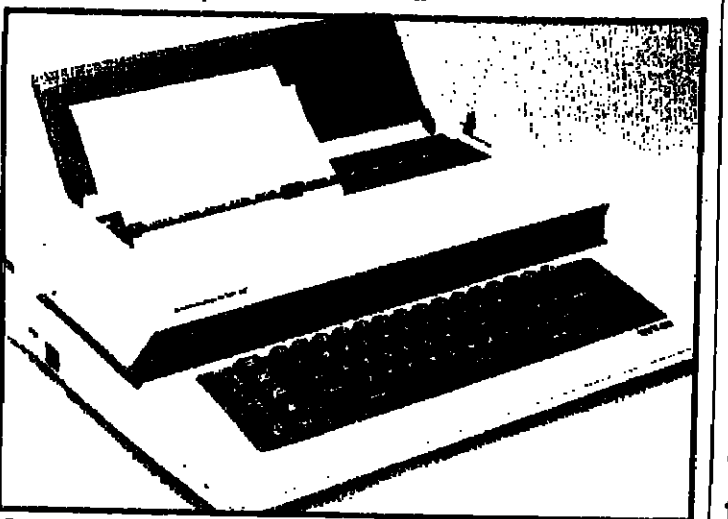
jamming as the machine remembers each letter and prints it perfectly even when familiar words are typed at high speed, says Infrascopie.

Margins and indents are pre-set at conventional positions for standard letters and can also be re-programmed to other desired positions at the touch of a button.

Simpler and easier statistical and column typing can be achieved with the Communicator II's tabulation feature.

The RS232C compatible port transforms the electronic typewriter into an RO printer terminal.

Infrascopie (CW), Longbeck Road, Marke, Redcar, Cleveland, TS11 6HQ. Tel: (0642) 472549



Communicator II from Infrascopie.

## Software hits Headline

HEADLINE is a microcomputer software package for emulating standard asynchronous teletype terminals allowing microcomputers to be used to access minicomputers and mainframes.

It was designed by Head Computers to meet the needs of searching large online information services such as Dialog, Pergamon InfoLine and Eurolek, but it can also be used to access other large computer systems which support teletype terminals.

Headline has features which allow the user to selectively read pre-stored input from disc and record results on disc for subsequent printing, editing or additional processing.

These features can also make Headline an aid for software development and support.

It will run on most micros which use the CP/M, CP/M-86 or MS-DOS operating systems. Headline has already been used on

Superbrain, Apple IIe (with CP/M card), Sirius 1, Cifer 1886, Cromemco System 3 (under CROS) and Shelton Sig/Net. Versions for the IBM Personal Computer and DEC Rainbow are in preparation.

The recommended price for Headline is £120 plus VAT.

Head Computers (CW), Oxted Mill, Spring Lane, Oxted, Surrey RH8 9PB. Tel: (088 33) 5580/7057.

## Data transfer at 2 Mbytes a second

XYLOGICS International's Model 472 tape controller board is now compatible with the Control Data Keystone III streaming tape drive, which operates at 6,250 bits per inch.

The board is compatible with the IEEE-796 Multibus system.

The single-board 472 can address 16 megabytes of memory and control eight drives running at speeds of between 12.5 and 125 inches a second and at a wide range of storage densities.

Data is transferred at two megabytes a second.

Performance is boosted by the 472's channel control techniques. Commands are issued from an operating system by creating an input and output parameter block and directing the 472 to it. Several blocks can be linked for high throughput.

XYlogics International (CW), 46-48 High Street, Slough SL1 1BN. Tel: (0753) 78921.

## Motorola adds to micro range

MOTOROLA has added a graphics processor board to its Versamodule microcomputer range. The new module, with its own 68000 processor, provides a resolution of 512 picture elements by 384, eight colours per element, 400 shades for filling in, memory to hold two display pages, automatic blinking on up to 15 display segments and 56 graphics commands. Extra commands, defined by the user, can be provided as firmware or loaded into memory on the board at run time.

The commands cover functions such as drawing a circle, rectangle, or line. Motorola says they have been chosen for industrial process monitoring and computer-aided design.

The module can be up to 30 feet from the monitor.

Motorola (CW), 58, Tanners Drive, Birklands, Milton Keynes MK14 5BP. Tel: (0908) 614614.



One of Inmac's new range of workstations.

## Workstation designed for micros

INMAC has designed a low-cost range of workstations for microcomputers and terminals.

Ruggedly constructed using a welded steel frame, the desks are finished with either an oak or sapele laminate which is stain resistant. The height of 66cms (26 inches) has been chosen as an optimum to suit the ergonomics of using most microcomputers.

Three sizes are available of 76cms deep (30 inches) by 110 cms (43 inches) wide, priced at £88; 76cms (30 inches) deep by 91cms

(36 inches) wide at £79; and 61cms (24 inches) deep by 91cms (36 inches) wide at £76. All have rounded corners for safety, and a modesty panel is provided as standard.

An optional shelf for £28 provides out-of-the-way storage for modems, spare floppies, reference books etc.

Instead of the adjustable feet provided, a set of casters is available for £7.50 consisting of two locking and two non-locking, which enables the workstation to

be easily rolled to a new location then secured in place.

The desks are flat-packed for ease of transit and handling. They can be assembled in 10 minutes using the instructions and the tools supplied, says Inmac.

The workstations are available from Inmac on a 30-day risk-free trial with next day delivery.

Inmac (UK) (CW), Davy Road, Astmoor, Runcorn, Cheshire WA7 1PZ. Tel: (09285) 67551.

## Full page text editing terminal launched

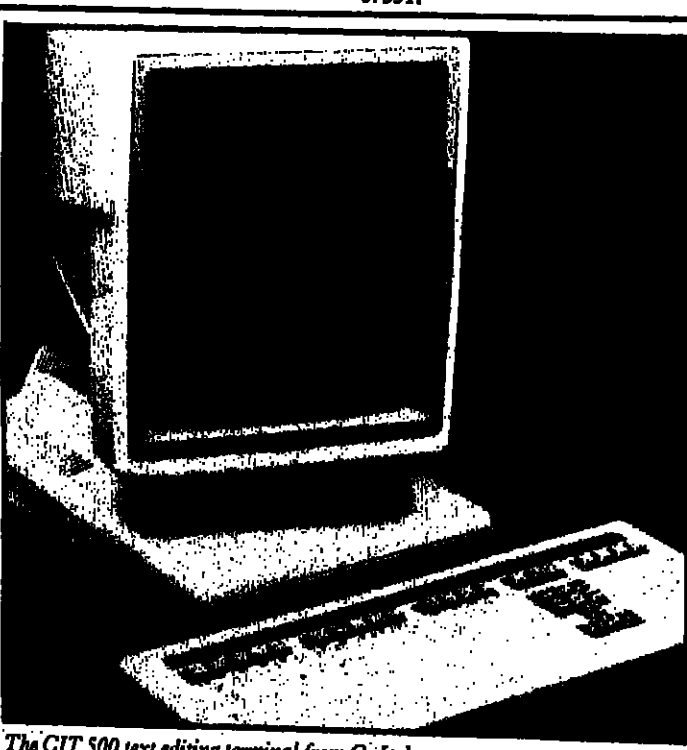
C. ITOH Electronics has introduced a new VT-100 compatible word processing and text editing terminal, the CIT-500, which has a 15in monitor, vertically mounted to provide full page format, with a 64 line by 80 character display.

It offers considerable editing flexibility. The keyboard can be altered to provide custom code generation; creation of special symbols can be offered through the local character generation mode; and automatic centering and underlining are provided, along with standard editing cursor control keys.

The CIT-500 provides logical and programmable video attributes; programmable function keys and printer port; downline loadable character sets, and I/O logic.

The ergonomic design of the terminal includes a tilt and swivel monitor and a detachable keyboard, also with tilt. The screen is non-glare with P39 phosphor. Matted keycaps and non-reflective surfaces complete the ergonomic design.

C. Itoh Electronics Co (CW), Beacon House, 26-28 Worpole Road, London, SW19. Tel: 01-946 4960.



The CIT 500 text editing terminal from C. Itoh.

## Updated floppy disc micros

TWO British-built floppy disc micros have been launched by Kalamazoo. The K1100 and K1200 replace the K1050, K1500 and K1600 models.

The new micros are more compact, cost less, offer increased disc capacity and comprise separate VDU, keyboard and processor. Smallest in the range, the

## Babynet makes its debut

BABYNET, a switching multipoint multiplexer, is the first product to make available the powerful combination of switching and multipoint multiplexing, says Network Products.

The Babynet switching capability allows mapping of connections from remote ports to computer ports. Remote ports can be permanently mapped to a particular computer port, automatically mapped on terminal connection to one part of a pre-designated group of ports, or mapped on terminal connection to one part of a user specified group of ports.

Babynet is a multipoint communications system, and uses a proprietary multipoint polling method called Adaptive Polling Technique. It continually monitors remote station activity and polls active stations at a much higher rate than inactive ones. This results in better response time for terminal users.

Babynet is a user expandable system. All three major functions — master, master expansion and node — are the same piece of hardware and may be interchanged. All units start at two channels and may be field upgraded in increments of three channels.

Babynet can be configured either via the front panel of each unit or through a dedicated or temporary control console. Console commands include setting or changing port characteristics, busy-out and access control of ports, group specification and diagnostic procedures.

The front panel of each unit provides a number of status displays including line status, line utilisation, port selection, transferred data, and communications error rates.

Operation is transparent to the computer, the terminal, and the user, and no systems or applications programming is necessary.

Network Products (CW), 387 Sykes Road, Slough Trading Estate, Slough, Berkshire. Tel: (0753) 821898.

## Daisy with IBM in mind

DECISION Data has designed a daisywheel printer for the IBM System 34, 36 and 38 business minicomputer ranges.

The new 6355-01 runs at 55 characters a second. Functions such as bold print, character overstrike, shadow print and underlining are implemented automatically by inserting simple data codes in the text.

Almost 600 different daisywheels are available. Fabric or mylar ribbon cartridges can be used. A tractor feed accessory enables the printer to handle continuous stationery in a variety of widths.

Decision Data (CW), Corrie House, 48-54 London Road, Staines, Middlesex TW18 4HQ. Tel: (0784) 59455.

## Display of 16 colours

AMBITRON, distributor for Ohio-based ID Systems, has launched the Colorgraphics ID-200 graphics terminal in the UK. The ID-200 offers business graphics users a combination of a 14in screen, 16 displayed colours and VT100 compatibility for less than £3,000.

ID-200 has a raster scan high resolution colour monitor with 1280x480 resolution and 60/50 Hz interlaced refresh rate. Sixteen colours can be displayed from a palette of 64.

Graphic features include 96 ASCII-displayable characters and 32 control characters in monitor

mode, 16 levels of zoom and pan functions, text and crosshair cursors, and 64 Kbytes of local memory for Vector List storage.

Drawing primitives include absolute/relative/concatenated vectors and moves, circles, bars, arcs, pies and polygons.

Ergonomically, the ID-200's monitor tilts through 30 degrees.

Prices for the ID-200 start from £2,900 one-off and user.

Ambitron (CW), 13 The Padlock Industrial Estate, Hambridge Road, Newbury, Berks RG13 5TQ. Tel: (0635) 32055.

## 256K memory doubled

A DOUBLED memory capacity for its 8600 processor and the addition of two new Winchester discs are announced by Datapoint UK.

Updated versions of the Datapoint RMS operating system and IROS word processing software have also been released.

Formerly endowed with up to 256K memory on 128K cards, the 8600 processor can now have 512K error correction code memory on a single card. The new memory requires only one card slot, and allows each processor to support more disc or diskette storage, screens, printers and communications facilities.

The new Plus series disc subsystems consist of the 10 plus 10 — two removable 10Mbyte eight-inch cartridge discs — and the 10 plus 40, a 40 Mbyte fixed-media disc and 10 Mbyte removable cartridge disc. Extensions are available on the first for up to 100 Mbytes of storage and for up to 130 Mbytes on the second, both in increments of 40 and 80 Mbytes.

The RMS 1.11 operating system supports the new discs as well as other peripherals.

Datapoint UK (CW), 400 North Circular Road, Neasden, London NW10 1JG. Tel: 01-459 1222.

## PRODUCTS

# Canadians join IBM-compatible market

CANADIAN video terminal Cybernex has entered the IBM-compatible market company with its XM-3270 model, to be marketed in the UK by Brent-Cybernex.

The XM-3270 provides full screen and keyboard emulation of IBM 3178 or 3278 (Type 2) terminal equipment.

On the communications side, the terminal may be used in conjunction with either software or hardware protocol converters (Simwave or Perle) to emulate synchronous IBM communications functionality, while retaining the simplicity of asynchronous RS232C communication and the attendant benefits of reduced installation costs and dial-up capability.

Use of these protocol converters gives the XM-3270 the appearance of an IBM 3270 when communicating with an IBM mainframe, front-end processor or cluster controller. Where multiple local or remote terminal clusters are involved a multiplexer facility, the

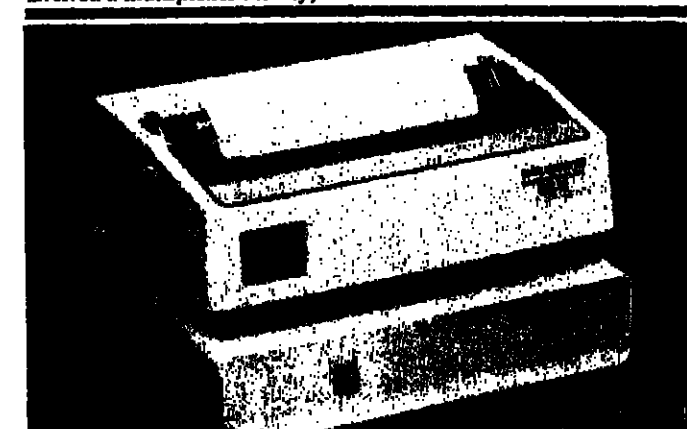
XM 3270MUX cuts the cost of individual port connection by allowing up to eight of the terminals to be connected, with one output link to the protocol converter, says Cybernex.

A feature of the XM3270 is the lookalike nature of its keyboard. This avoids the multi-key sequence commonly associated with ASCII terminals emulating IBM 3270 equipment.

A further advantage for large, mixed system users is the incorporation of an Ansi 3.64 subset for system log-on and configuration, which also provides access to DEC systems in character mode. This saves the number of terminals required on such sites.

Ancillary economies include the ability to dump out on to relatively cheap printers if required.

Brent-Cybernex (CW), Sovereign House, Dallow Road, Luton, Beds LU1 1TP. Tel: 0582 452020.



Telephone call logging system.

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## Multi-files go on information system

MICROFT Technology's Aspect information management system for microcomputers is designed for use in business, research and education, and is aimed at anyone who wishes to store and analyse information, whether or not they have any previous computer experience.

Aspect offers full relational database facilities including multi-file processing, and has a hierarchical file facility. Up to seven levels can be defined for each file.

All operations in Aspect can be actioned either through menus (both system standard and user designed), or by the use of direct commands for quicker access by the experienced user.

Aspect routines, called Macros, are written in an English-like language, and can be created either directly by the user or generated by the system itself in a question and answer session.

Macros can be changed at any time as user requirements alter. Aspect can process up to 12 files simultaneously on a 128K computer and proportionately more on larger machines. A file can contain up to 3,500 characters.

Currently available on the IBM-PC (128K minimum memory) and the Sirius, Aspect is priced at £400 plus Vat.

Microft Technology (CW), 45a Radnor Walk, London SW3 4BP. Tel: 01-352 7876.

## Magnetic tape coupler

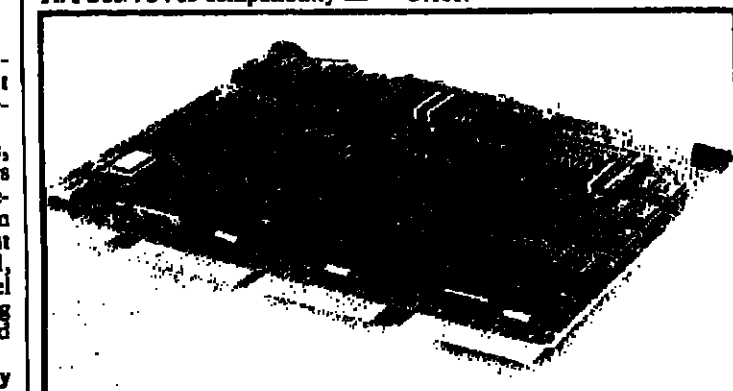
A NEW Win magnetic tape coupler that interfaces a single CDC Vain Sentinel streaming cartridge drive, is now available from Dilog distributors for interface to DEC LS1-11-11/23Plus and Micro/PDP-11 computers.

Designated the Model DQ342, the controller is complete on a single quad printed circuit board that contains the circuitry for TS-11/TU80/TSV05 compatibility un-

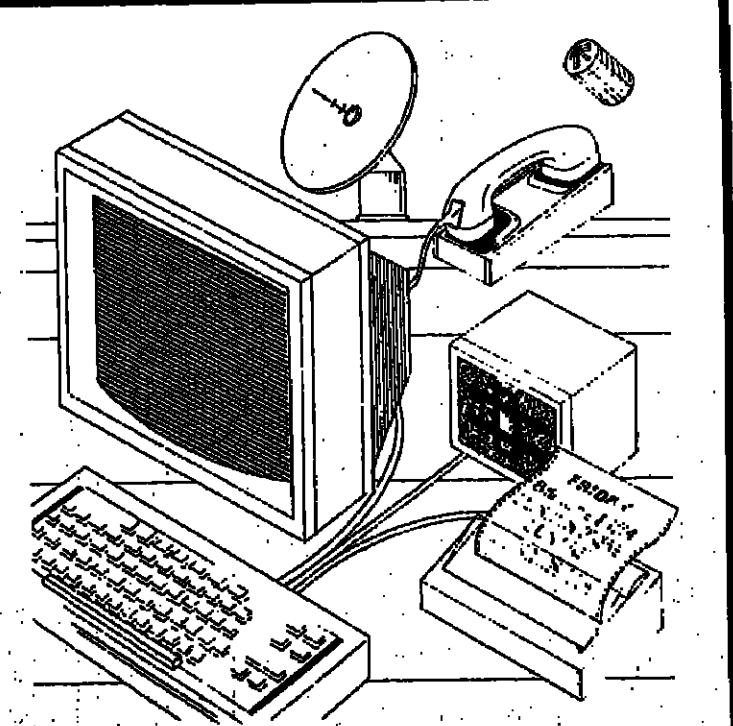
der RT-11, RSX-11 and RSTS operating systems.

The controller features 22-bit addressing for four megabyte, block mode DMA, switch selectable interrupt vector and register address, plus DMA four word burst size.

Dilog International (CW), 12 Temple Square, Aylesbury, Bucks HP20 2QL. Tel: (0296) 84101.



The Model DQ343 on a single quad printed circuit board.



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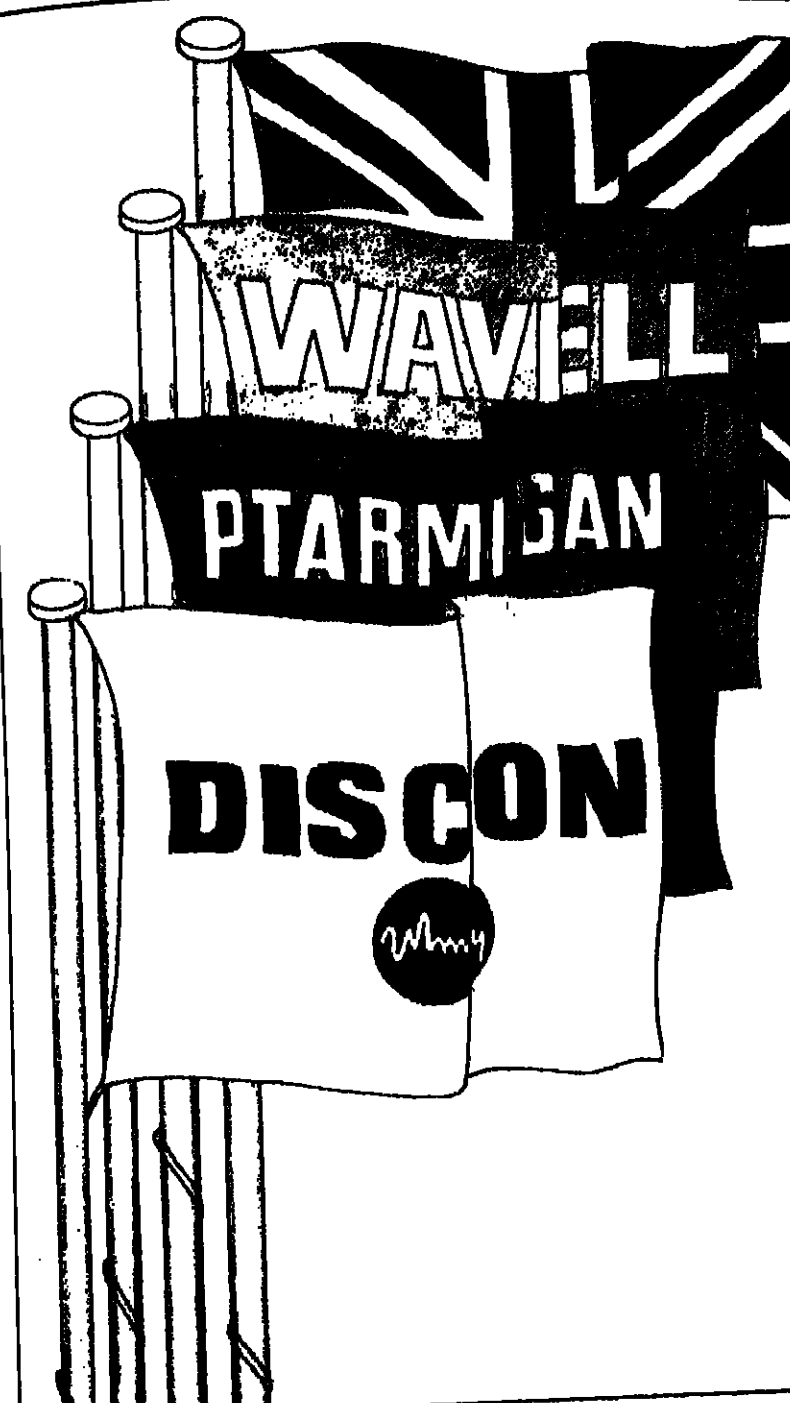
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Please write enclosing a full CV or ring for an application form to J. Hilliker, Recruitment Manager, Plessey Defence Systems Limited, Grange Road, Somerford, Christchurch, Dorset BH23 4JB. Tel: Christchurch (0202) 488344 or FREEPHONE 9021 (24 hour service). Please quote ref: CW/3/B4.

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**GOLDEN RIVER LIMITED** is indisputably the leader in its field of microprocessor based measuring and logging equipment. This equipment is used world-wide in a variety of environmental conditions. Around 25-30% of Company personnel are working in research and development and further bright young people with at least one years industrial experience are required for lone or team projectwork. Facilities and conditions are excellent, as are opportunities for gaining considerable experience.

**Programmers** to £11k + O/T

For one of these positions, developing system software for new products, you will preferably be experienced with assembler and at least one high level systems programming language. A knowledge of FORTRAN would be ideal and a good appreciation of microprocessor hardware useful, as you will be working closely with electronic design engineers.

**Design/Development Engineers** to £11k + O/T

For one of these positions you will be experienced in microprocessor hardware design, with low power analogue and digital experience being ideal. Because **GOLDEN RIVER** products have to function in severe environments a background in design for military applications would be most appropriate.

**GOLDEN RIVER LIMITED** is expanding by 40% this year. If you have good qualifications and aptitude and can convince us that you have the right sort of potential for a company that is going places, we would like to hear from you without delay. Relocation assistance to the area is appropriate cases will be provided.

In the first instance, please contact **Digby A. Dyke** on 0905 611512 office hours or 06845 2210 evenings and weekends (transfer charges if necessary), or write to him at the address below.

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The British Manufacture and Research Company Limited, a successful precision engineering company and member of the Swiss Oerlikon Bührle Group invites applications for the following positions:

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Attractive Negotiable Package

Reporting directly to the DP Manager, prime responsibilities will be to design, develop and implement Company-wide computer systems throughout the full sphere of business activities, and to prepare and issue all appropriate systems documentation.

Applicants, male or female, will have had a minimum of 8 years business systems experience, of which at least 3 years will have been spent in analysis and programming. Ideally candidates should have a good working experience of RPG on IBM GDS equipment and possess the right potential for retraining on IBM System 38 and operating in a full project management role.

## O&M Analyst

£8-10K plus bonus

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Write in confidence, with full details of your age, salary, qualifications and career history to our Personnel Services Manager, Mr G Walker, or telephone him on Grantham (0476) 65677 Extension 3165.

**British Manufacture and Research Company Ltd.**

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A member of the Oerlikon Bührle Group

(0614)

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Specific experience at senior level on inventory, Military Logistics (6871 or 8711 ideally), work performance scheduling and control systems would be ideal. Responsibilities will include sub-systems project development.

### BUSINESS/O&M ANALYST

Responsibilities will include systems procedures, cost training, system utilisation and integration of sub-system elements. An analytical/programming and operations background would be ideal.

### SYSTEMS ANALYST

Systems experience gained on Materials/Inventory/Supply/Logistics systems combined with a COBOL programming background would be ideal. HP 3000/IMAGE or equivalent mini experience preferred.

### SENIOR OPERATORS, OPERATORS DB DATA CONTROL STAFF

Candidates at all levels for personnel with HP 3000 experience at the IBM/HP Headquarters Centre and others at the HP sites. Database Data Control personnel will be required to assist with the maintenance and operation of the databases.

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A minimum of three years COBOL programming experience is required. The successful candidate should be an HP 3000 with IMAGE and ideally COBOL/SQL/PL/1.

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Responsibilities also include the control of the communications network based on DRS and 7502 systems.

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Application forms and further details from Director of Finance, London Borough of Hammersmith & Fulham, PO Box 394, Town Hall, King Street, London W6 9JU. Tel: 01-748 3020, ext. 233, quoting ref: FC 007.

OR you can call 01-741 0804 (24-hour answering service) to obtain your application form and information package (Ref: FC 007). Closing date April 13th, 1984.

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You will be responsible for the management, marketing and production of hard copy and database products, and for efficiently planning and profitably developing these activities within public and private Videotex systems worldwide.

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## THORNHILL Business Systems

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We are a small progressive software house providing professional computer service to business and industry from consultancy and management to systems development and technical support. Our expansion plans now require us to recruit permanent self-motivated and high calibre individuals with the initiative and commitment to work in a challenging and varied environment.

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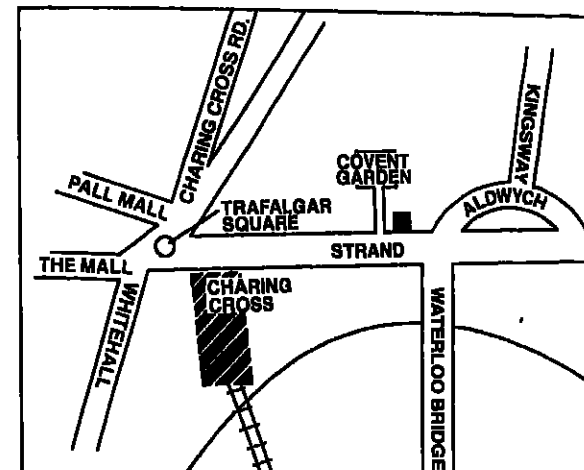
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Salaries are negotiable and terms and conditions will reflect the level of these appointments. Where appropriate, a relocation package will be available to assist successful candidates in moving to this highly attractive area of the South West.

In the first instance, send your c.v. in confidence, quoting Ref: 240/DH, to D.P. Healy, Recruitment Department, FPC 104, British Aerospace PLC, Dynamics Group, FREEPOST (BS 3566), Bristol BS12 7BR. No stamp required. Alternatively you can telephone for an application form on FREEFONE 9918, Ext. 1030/778.



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## HEAD OF COMPUTER SYSTEMS

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Applicants should write in confidence with full details of previous experience to V. H. Carty, Personnel Administration Manager, RAC Motoring Services, RAC House, Lansdowne Road, Croydon, CR9 2JA.



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**pros'per** v.i. succeed; flourish; good fortune

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(0635) 

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- An equal opportunity employer
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**IBM**

(0643)

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Interviews will be arranged in the United Kingdom, and short-listed applicants will be given the opportunity to discuss the company with a senior NCR Australian Manager who plans to be in London in mid 1984.

Applications are required in Australia and should be addressed to F.R. Hayman  
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P.O. Box 732  
Crows Nest NSW 2065  
AUSTRALIA

(0688)



# your appointments register

## Programmers

NCR/IBM/COBOL to £15K  
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Ideally 12 years' experience in D.P. with at least three years' experience in the administrative management and or supervision of large scale UNIVAC DMS 1100 systems.

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Ideally seven years' experience operating a UNIVAC 1100 series mainframe in an operational and production environment, at least five of which have been in a supervisory or managerial capacity (25 employees or more).

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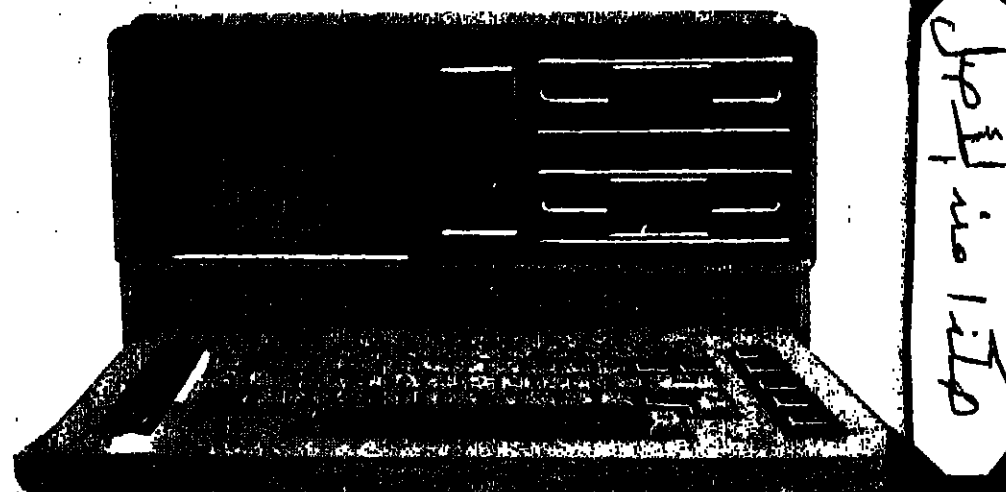
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Please write for an application form to: Brian Sanderson, UK Personnel, Sperry Ltd., Sperry Centre, Stonebridge Park, London NW10 8LS.



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To apply, please send an up-to-date CV to: Wayne Stinton, Systems Manager, Phillips & Drew, 120 Moorgate, London EC2M 6XP. Telephone: 01-628 4444.

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Our Client, a major UK based international company, has recently completed a full reorganisation of their hardware. They have just installed a 16 megabyte 16 channel IBM 3083 running under MVS/XA, this is due to be upgraded to 24 megabytes with 24 channels. They also support an expanding network of mini's, micros and IBM PC's with a separate IBM 4341 dedicated to the Information Centre concept.

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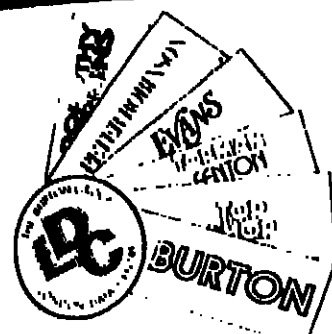
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### SENIOR ANALYST

(Merchandising and Distribution)  
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### SENIOR ANALYST

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## ROYAL LIFE

Royal Life is entering a period of dynamic development of its IBM Main Frame Computer Systems, and to answer the many and diverse technical questions that this development introduces we need to expand our Programming and Technical Support Teams. Royal Life operates an IBM 3033 (due to be replaced in 1985) operating under VM, MVS and IMS/DB/DC. Local On-Line Systems are in operation, but we are moving into remote telecommunications. Work in personal computing and in convergence is growing and the opportunities for career progression are good.

### EXPERIENCED SYSTEMS PROGRAMMERS

We are seeking Experienced Systems Programmers to work as members of the Technical Support Team. The successful candidates will already have practical experience in one or more of the following disciplines: VM... MVS... IMS (DB, DC, Fast Path), Tele-processing (particularly with IBM Equipment and Protocols)... Teletex (viewdata). Salary will be in the range of £10,400 to £12,300 depending on experience and qualifications.

### PROGRAMMERS/ ANALYST PROGRAMMERS

We also require Applications Programmers/Analyst Programmers with potential to resource a number of major projects in an expanding department. The successful candidates will have a minimum of: 2 good A levels. Around 2 years programming experience in PL/I. Experience of IMS, DB/DC would be an advantage but training will be given where necessary. Salary will be in the range of £7,500 to £10,500 depending upon experience. Royal Life's staff benefits include pension scheme and mortgage facilities at favourable rates.

Applications giving details of qualifications and work experience should be made to: **Royal Life** Life is what you make it. David Kirby, Royal Life, P.O. Box 30, New Hall Place, Liverpool L69 3HR.



## EUROLINK

COMPUTER SERVICES LIMITED

EQUITY & LAW HOUSE, 102 QUEENS ROAD, BRIGHTON BN1 3YP  
Telephone Brighton (0273) 202316 (24-hour Answering Service)  
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Our client is a privately-owned multi-million pound organisation with manufacturing and marketing facilities throughout the world. Their range of products are widely accepted by consumers who demand the best in quality, and in consequence the company has enjoyed many years of continuous growth and profitability. In the U.K. they occupy a green fields site located in one of the most beautiful counties in England.

The company's information systems needs are provided by an IBM System 38 Model 7 two-megabyte machine, but further enhancements are envisaged. The D.P. Department is professionally managed and staffed by programmers and analyst/programmers who have worked diligently to build up an enviable reputation with their end users. Accordingly, the D.P. facility has the absolute support of senior management who recognise the degree of reliance now placed upon the System 38 by all operational areas of the company.

As the result of an increased workload, several vacancies have been created for experienced GSD Analyst/Programmers with about 18 months/two years' RPG 2 or 3. In addition, the applicants must be able to offer sound analysis skills obtained in either a commercial or manufacturing environment. System 38 training will be provided where necessary.

These openings offer an attractive opportunity for career-minded applicants to enhance their experience with a company committed to their development. The base salary is supported by a range of other benefits making the earnings package very competitive.

If you would like more information, please contact Paula on our Brighton telephone number (open till 8 p.m.), quoting reference number PRD 008/84.

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Our client is seeking a Chief Programmer for major development work.

Reporting directly to the Data Processing Manager, you will be responsible for several other staff; ideally you will be in your late twenties to early thirties with some years' experience.

For this position a good ICL programming background is essential; together with a thorough understanding of TPS and Database systems, preferably Total.

The Company is shortly changing from a DME to a VME operating system environment; a good knowledge of both systems would therefore be advantageous.

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Candidates, male or female, must have experience of IBM 4300 Systems, combined with a background of around 5 years' in running computer operations, and some COBOL programming.

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For an application form please ring Terry Archbold on FREEPHONE 2740, or write to him at British Telecom, Room 26/48, Euston Tower, 286 Euston Road, London NW1 3DG. Please quote reference CW/29/3.

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Nottingham

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These two appointments will be concerned with the evaluation of user department requests for new information systems, for specifying their implementation and for preparing the necessary programmes, primarily using COBOL.

The Department works to a high technical specification and ability demonstrated over two or more years in programming/analyst work is more significant than age or formal qualifications. A knowledge of structured programming and database would be of special benefit.

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waiting for the right opportunity

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c. £11,000 p.a.

looking for a new challenge

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Our client is a prestigious U.K. financial services organisation with worldwide links. Due to continued expansion they now require talented Analysts/Programmers with good Datapoint Database experience for several major interesting development projects. Career progression opportunities are unlimited and if you prefer to specialise in a certain area you will be given the opportunity to do so. People with the skills and motivation to work in this fast growing and challenging environment will be rewarded with an excellent package and first class working conditions. *AW 3962*

### IBM COBOL — CICS TRAINING! London to £13,000

A host of new projects has created the need to set up a new development team within the Central London based firm. It includes IBM 4341, DOS/VSE, VM/CMS with CICS and DL/I. You should have a sound education, a minimum of two years' IBM COBOL, DOS/VSE, and the ability to learn new techniques, extend your analysis skills and get in at the start of planned expansion. Full training can be provided in CICS and DL/I and benefits include annual bonus, flextime and travel loans. *CW 4141*

### NCR ANALYST/PROGRAMMER London/Middx Borders £11,000

Our client is a national retailing establishment and is seeking an Analyst/Programmer with at least two years' NCR 5300/50 and database experience to join an exciting development project team. The job will involve extensive user liaison and gives every opportunity to develop your analytical and design skills to the full. A full range of benefits and a structured career path are offered to keen, enthusiastic individuals. *AW 4184*

These positions are just a brief selection from our extensive database of jobs in London and the South East. If you cannot see a position advertised for your particular skills, or are considering relocating or a change of the way you work, please call or write to us in touch with a consultant specialising in your field. 70% of jobs in the industry are never advertised. Why not let us tell you about some of them? We look forward to hearing from you.

### BURROUGHS — LARGE SYSTEMS Herts c. £10,000

Based in Central Hertfordshire, this multi-national user is seeking a programmer/analyst to work in a multi-national environment. If you have a minimum of two years' COBOL or medium to large Burroughs machine and would like to progress a step forward into analysis and user contact, this could be the move for you. Why not call for further details. *AW 4118*

### PROGRAMMER/ANALYST IBM DEVELOPMENT Essex to £10,000

Due to this company's expansion plans for 1984 a position has been created for an IBM 4341/4381 Programmer/Analyst to be involved with the development of financial sales and marketing systems. This is an exciting opportunity for someone who wishes to further their technical experience. An IBM DOS/VSE background is essential and 1-2 years experience would be desirable, however, training can be provided. The company offer an excellent range of benefits including flexitime and staff restaurant. *CW 3993*

### ICL ME29 PROGRAMMER/ JUNIOR ANALYST Middx c. £8,500

Our client, an internationally known household name, now have openings in their small D.P. department for Programmer with 18 months' experience of ICL COBOL and a good commercial background. The company also wish to hear from a well-qualified professional who wishes to move into analysis at a junior level. You should have some exposure to systems in a business or commercial environment, and preferably a knowledge of programming. The right candidate will be offered excellent long-term career prospects. *TW 4126*

### IBM — ALL AREAS The Pick of the Jobs! £8-14,000

We have clients throughout London, Essex, Herts, Berks, Surrey, Kent, Middx and Hants look for talented and ambitious Programmers, Analysts, Programmers and Systems People with a minimum of 18 months' COBOL, RPG III, PL/I or ASSEMBLER gained in an IBM environment. If you find that you are not being adequately rewarded, or would like to enhance your skills with on-line or database training, give us a ring and one of our consultants would be pleased to assist. *GC GEN*

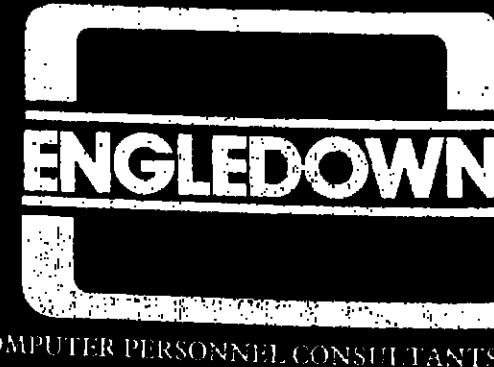
### IBM SYSTEM 38 West End To £11,500

Our client, an international consumer products group, now have openings in their D.P. department for an experienced Programmer and Analyst/Programmer both with an RPG III background. This is an expanding department therefore the candidates appointed can expect career progression as the main emphasis of the positions will be the implementation of new systems. To discuss these positions further please contact the consultants as possible. *GW 4349*

### PL/1 — Berkshire, Surrey London £8-12,000

Internationally renowned marketing firm on the Middlesex/Berkshire border requires an Analyst/Programmer with around three years' IBM PL/1 experience to take a leading role in their team. They utilize IBM VSE, CICS and DL/I and you would be developing a range of online sales and marketing applications, housing both users on a regular basis and write-time specs. Benefits include annual bonus. I also have positions in London, Surrey, Middlesex and Kent for Programmers with 18 months' PL/1, offering excellent career progression, relocation expenses, etc. *CW 4141*

Brushfield House, 12 Brushfield Street  
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Telephone: 01-247 3356 (24 Hours)



COMPUTER PERSONNEL CONSULTANTS



## SALES PROFESSIONALS Home Counties West

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## FOR BUSINESS-WINNERS

The company requires highly motivated, revenue creating sales professionals to open new accounts and capitalise on existing contracts. Business development is countrywide although initially candidates will be based in the Western Home Counties.

You should be an entrepreneurial, profit-orientated, enthusiastic individual with extensive knowledge of computer hardware.

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**Base salary will be c.£15,000 plus commission — with a guaranteed commission rate for the first 6 months —**

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If you are a business winner, call me, Mike Beer, on 01-242 9356. Alternatively send me your CV, quoting reference CW1971-B.

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  - ★ Sales Executive
  - ★ Sales Executive
  - ★ Sales Executive
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  - Word and Information Processing Systems
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Candidates are required to forward full c.v.s to:



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## YOUNG SOFTWARE CONSULTANTS £9-11K Maidenhead

Sphinx in its first year of operation has made a remarkable impact on the mini-computer industry as the UNIX® Systems expert. The growth of this exciting Company, fuelled by a strong demand for the products, presents first rate job opportunities to bright young people with a solid educational background and some practical experience.

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The Software Development Group are involved in the conversion of well established packages to the UNIX System and thus to take advantage of the extended facilities offered. The Consultant who joins this team will have programming experience within business and accounting systems. Knowledge of UNIX and 'C' would be a distinct advantage but training is available for the right candidate who has been developing or amending packages.

### SALES SUPPORT

The Sales Support Group now need to augment their skills in the business systems area and the new Consultant will ensure that the product meets the customer's needs and that each package is effectively installed. Candidates should have hands-on experience and have knowledge of a wide range of business software, perhaps with some programming experience.

The preferred age is around 25 for both jobs but more important is relevant experience and initiative. The salary will be negotiated and the other terms and conditions are excellent. The facilities and prospects are first class.

Please provide a curriculum vitae or call me Phillip Rich the Consultant advising Sphinx on these appointments.



Phillip Rich, Clark Rich Associates Limited,  
31 Peasod Street, Windsor, Berkshire SL4 1EA.  
Tel: Windsor (07535) 51212.

**Clark Rich Associates Limited**  
Personnel Consultants

\*UNIX is a trademark of Bell Laboratories



## CAD/CAM Consultants

**To £18,000 Nationwide**  
A leading computer consultancy is looking for potential consultants, in the age range 25-35, who are already experienced in CAD/CAM. Successful candidates need to be mobile in the UK. Engineering qualifications would be an extra recommendation. **CW1301**

## Systems Analysts/Engineers

**To £12,700 Essex**  
Projects developed on VAX, PDP11 and GA minicomputers using VMS, RSX11 and Control IV. Applications written in PASCAL, BCPL and Assembler languages. Age to 40; Computer Science, Scientific, Engineering degree or equivalent; 2-3 years' experience in real-time/process control. **CW1302**

## Data Base Team Leader and Programmers

**Salary £9-£13,000 p.a. London**  
To manage team of three programmers designing and implementing a number of complex data bases related to an advanced process plant. Hewlett Packard Image experience essential. **CW1303**

## Real Time Control - Programmers

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## Project Managers/Leaders Analysts & Programmers

**£ negotiable Slough**  
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## Array Processor Salesman

**£20,000 Nationwide**  
Required for UK subsidiary of major USA corporation must have good working knowledge of mainframe computers and be capable of discussion at the highest level with the applications of array processors. Salary will be commensurate with experience but is expected to be in excess of 20K including commission. **CW1306**

## APL Consultants

**£ negotiable Birmingham**  
Working in a small team in the support and maintenance of our software. Duties will include liaison with our development team, support for our sales team, software installations and applications programming with our clients. Applicants should have a minimum of 3 years APL experience with particular emphasis on IBM mainframes under VM/CMS and MVS/TSO. Salary commensurate with experience. **CW1307**

**Phone 01-549 9236**

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££12,500 + EXCELLENT BANKING BENEFITS

Our client who is an International Bank with their Head Office in New York, seeks to recruit an additional Analyst/Programmer who can complement their 1984 expansion.

You should ideally have at least three years' Data Processing experience preferably in a banking environment but they would also consider a general financial applications background.

They are currently running IBM 4300s using COBOL, CICS and DL/1 with plans of upgrading to IBM 3083 using MVS. Any experience of MVS would be advantageous, if not training would be given.

Excellent benefits include:

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**Lloyd Chapman  
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### Programming Supervisor to £11.5K

DEC VMS RSTS BASIC-II COBOL DIBOL

For this senior position you will require a minimum of 4 to 5 years experience as programmer and analyst/programmer in commercial systems development, maintenance and customer support. You will direct and control a small team of experienced people whilst maintaining close personal contacts with customers from user department to managing director level. No further major development using DIBOL will take place, although a good knowledge of DIBOL is essential. The only other minimum requirement is RSTS and Basic or COBOL. For future projects VAX/VMS experience would be very desirable.

### Sales Executive £17K QE + Car

MAJOR PRODUCTION CONTROL SYSTEM

This is a newly created appointment for an experienced person with a proven sales track-record, to sell a major new production control system. Applicants will ideally be in the age range 25 to 35 and have a sales background in applications software or turnkey systems. A knowledge of manufacturing and/or experience with selling manufacturing packages would be ideal.

Staveley Computing is a fast developing and leading Software House with long established customers, and a rapidly expanding new-customer base. The Company provides a range of major commercial and technical packages, and bespoke systems development. Two opportunities exist for people to join this Company where merit is recognised and rewarded, and good careers made.

For further information regarding either of these positions, telephone Digby Dyke on 0906 811612 office hours, or 09045 2210 evenings and weekends, or write to him at the address below.

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## Senior Programmers to £9,660 Programmers to £7,896

Best of all, as a Programmer with the 73-strong Joint Computer Department (JCD) of Norfolk County Council and Norwich City Council, you'd be really involved with the computing development of both authorities and in applications covering the whole spectrum of local government responsibilities, from budgetary control to housing, rating and education, accident statistics, manpower planning and social services. Growing demand for our services has created a need for Senior Programmers and Programmers to be based in the JCD at County Hall, which is set in parkland on the edge of the City.



# When the world's your oyster, why NORWICH?

It houses twin IBM 4341/4302 computers supporting 170 terminals together with a CMC Reality and IBM PC and Superbrain microcomputers. GUTS (timesharing) and CICS systems are used for most development work. The terminal network over the county is expected to increase substantially over the next two years and mainframe development will make use of productivity aids, packages etc. A research team has been set up to help introduce new small systems. The environment is progressive, challenging and sure to widen your skills.

We are particularly looking for candidates with experience of PL/1, but experience of Cobol programming would be considered. Knowledge of Assembler, UFO or Easytrieve would also be useful. At either level you would work as a member of a team, so good interpersonal skills are considered desirable. This is especially important for the Senior Programmers, who should be capable of supervising junior staff and of writing program specifications.

Telephone Tony Woodhouse NOW on Norwich (0603) 611122, ext. 5159 for further information or send full details to Development Manager, Norfolk and Norwich Joint Computer Department, County Hall, Norwich, NR1 2DH.

Closing date 19th April 1984.

## ANALYST/ PROGRAMMERS

**Salary  
£8,900-£11,000+**

**IBM System 38**

**RPG III/COBOL**

**European Visits**

**Nottingham**

Part of a multi-million pound Group, we are an acknowledged leader in our field and, over many years, have enjoyed an enviable reputation for the quality of our product range.

Based in Nottingham with its inexpensive housing, we have all the advantages of big City life combined with our close proximity to beautiful countryside. The City's cultural and sporting heritage is renowned. Road, rail and air communications with the rest of the Country are excellent.

The Group is totally committed to Data Processing and our IBM System 38 is central to our business activities. We are currently able to offer exceptional opportunities to two System 38 professionals. Successful applicants will require a thorough understanding of RPG III, although experienced IBM COBOL Programmers with GSD exposure and the required levels of technical ability and business awareness will be given formal training in RPG III.

This is a first class chance to become an integral member of a small Data Processing team actively involved in projects from initial user contact to systems specification and design through to programming and implementation. Our standards are high, but we are quick to recognise potential and prospects within the Group are second to none.

The comprehensive remuneration package will include 20 days annual leave, subsidised meals, generous pension and life assurance cover. We will also provide assistance with relocation where appropriate.

For an immediate interview, please contact Jim Mitchell on 021 236 3761 (24 hour answering service) or at home on 021 427 2291 (evenings and weekends until 9 p.m.).

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# SOFTWARE PROFESSIONALS

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Logica BV, part of Logica Holdings, is the leading Systems House specialising in High Technology in Holland today.

Based in Rotterdam, Logica have achieved considerable growth and success in developing and implementing Systems in the following sectors: communications, energy, defence, industrial and finance/banking.

Logica BV is still a relatively small operating company, offering significant career growth combining the following factors: a) a wide variety of technical projects, b) European travel opportunities, c) project and manpower responsibilities and d) active involvement in client liaison/sales support.

For further written information please telephone or write (preferably including a C.V.) to April Advertising. Initial interviews will take place in London during April with final interviews in Rotterdam to follow.

The company is currently seeking to recruit candidates to work on advance Communications and Defence Systems.

Experience in one or more of the following areas is most appropriate.

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## Saudi Arabia — A strong foundation for your future as a Hardware Engineer.



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Living and working in Saudi Arabia is a unique experience. Those who derive the most benefit are the professionals who respond to challenge, accept the different culture and lifestyle in a mature fashion, enjoy the support of their wives and families. Without doubt, the compensations include the equable climate, the opportunity to pursue leisure interests and the financial remuneration which ensures the accruing of a considerable nest-egg for the future.

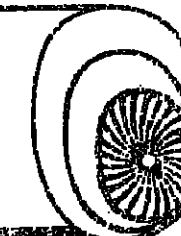
If you would like to learn more about the opportunities waiting for you in Saudi Arabia, please telephone Marilyn Davidson 01-836 6775 to arrange a confidential meeting. Computer Personnel International, 30-32 Southampton Street, London WC2E 7BR.

Our Client, one of the UK's leading large, IBM-compatible mainframe manufacturers, wishes to appoint four field service professionals who will work in Saudi Arabia, initially for a 3 year contract but with real prospects for a long term career commitment.

Based in either Riyadh or Dammam, the successful applicants would earn between £28,000 and £40,000 per annum tax free. This includes a 60% of basic salary posting allowance, foreign service bonus and a family allowance (if applicable). The company will also provide the following:

- Free housing of a high standard within a European complex, containing sports and leisure amenities, plus financial assistance with the purchase of domestic essentials.
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- Private education provided at the local international school.
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- Free flights home once a year.
- Annual salary review.

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Farnborough,  
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To £13K

Real Time Developments is an independent systems house specialising in high-quality real-time software systems. We have an immediate requirement for a number of real-time software specialists to enable us to expand in line with our plans for 1984. The people we are looking for are preferably graduates with two or more years experience in any real-time applications. Experience should have been gained on minis or micros, with knowledge of both assembler and high-level languages.

Apart from a highly competitive salary, benefits include BUPA, health assurance and paid overtime. The company offers ample scope for genuine career advancement, with employees being encouraged to assume responsibility as soon as they are ready for it. 1984 holds great promise for RTD; why not be part of our success story? For more details contact Geoff Burnes on Farnborough (0253) 546213 or write to



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We're a major force in the Office Systems Market, with a large established client base, a fast-expanding product range featuring very advanced software and an unrivalled reputation for technical support. Our business has expanded by over 50% in the last two years, and our corporate goals are to maintain this growth pattern over the next five years.

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If you are the person we are looking for, your wide-ranging brief will include system design and configuration, selling applications/solutions, demonstrating and installing hardware and software in short, providing a comprehensive sales support service.

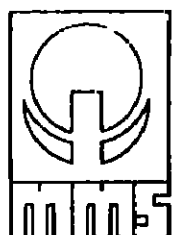
It's a role that offers variety, responsibility, considerable freedom, and total involvement in the systems solution. Beyond this, excellent career opportunities exist within the company.

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To discuss the job in more detail call David Kirk, Regional Marketing Services Manager on 01-367 6023 during office hours or if you prefer you can write to him giving full details of your career at WORDPLEX LIMITED, 371 Euston Road, London NW1 6AN.

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READING

Our client Micro Memory Systems is dedicated to the development of high technology peripheral products, and is one of the most successful distributors of computer peripherals and micro related disk subsystem products in Europe. As part of their expansion programme, they have opened a new subsystem production and assembly centre based close to Junction 12 on the M4.

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**£7-£11K + Bonus + Benefits**

The continuing success of our client's products has led to an expansion of their software department. This has created an opportunity for an ambitious and energetic professional to become closely involved in the development of software to integrate our client's range of products to various micro-computers. This will include designing and developing device drivers and diagnostic utilities, and suitable candidates will have experience in one or more of the following:-

- 1-4 years software development on micros, and/or micro-assembly or additional high level language usability.
- Understanding of micro operating systems.

This exciting and challenging role offers total involvement, the opportunity to extend your skills, and the facility to become familiar with a variety of 8 and 16 bit micro and software (example MS-DOS, PC-DOS, CP/M-86, etc.).

For further information call Keith Taylor at our Reading office or write enclosing full c.v.

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### HARDWARE DEVELOPMENT SPECIALIST

**circa £11K + Bonus + Benefits**

As a result of the company's growth, we are seeking a bright and competent individual to develop micro related hardware within a small but extremely professional team. Candidates must have a good grounding in electronic engineering, show a practical knowledge of micro processors and a working knowledge of software.

Ideally, the candidate will already have experience in disk drives and controller technologies, in a similar environment, but consideration will be given to candidates working in a peripheral/systems company in a field service environment.

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(Salary £10,242 to £11,384 per annum)

This is a post responsible (along with the Computer Manager) for the analysis, development, implementation and operation of multi-user computer systems using Perkin Elmer 3200 range mini computers, with Reliance data management.

Applicants should be educated to degree standard, and have sufficient relevant experience to undertake this highly responsible and demanding post. The Authority has a scheme for the payment of removal expenses in appropriate cases.

A car-user allowance is payable.

All appointments are subject to a satisfactory medical report and to the provisions of the Local Government Superannuation Acts.

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(B547)

### STROUD - IN THE COTSWOLDS

### ANALYST/PROGRAMMER

to be responsible for maintaining existing systems and developing new systems to run on an IBM System 34.

The successful applicant must have proven experience of RPG II programming and the ability to understand, analyse and react quickly to user requirements. Solid experience is more important than academic qualifications and a working knowledge of engineering and financial systems in a manufacturing environment will be of help.

We are an international leader in Mechanical Handling Engineering and the successful applicant, who must have a versatile approach, will report to the Systems Manager.

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## SYSTEMS & PROGRAMMING

### ANALYST/PROGRAMMERS

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Earn high tax-free salaries and enjoy top benefits including FREE ACCOMMODATION. Applicants should possess a minimum of two years' IBM COBOL experience, preferably gained in an online database environment. Ref: T2435

### IBM RPGII/RPGIII

**C. & GREATER LONDON** **£7,000-£17,000**

A small but established systems house is currently seeking to recruit IBM professionals of various levels, to work on varied and interesting projects for their prestigious clients. This is an excellent opportunity to keep abreast of the latest hardware/software developments and to take advantage of excellent training facilities. The company offers genuine scope for job interest and career development. Benefits include paid overtime and expenses. Ref: D2450

### IBM SYSTEMS PROGRAMMERS

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### IBM PROJECT/TEAM LEADER

**LONDON & H. COUNTIES** **£9,000-£12,000 + CAR**

Unique opportunity to progress for an ambitious individual with strong CICS & DL/I experience (preferably COBOL). The successful applicant will be responsible for a rapidly expanding section within a leading computer services company. Phone now for further details. Ref: T2488

### IBM PROGRAMMERS & ANALYST/PROGRAMMERS

**C. LONDON** **£9,000-£12,000 + CAR**

Successful software house is seeking to recruit several programmers and Analysts/Programmers with IBM COBOL (and CICS & DL/I) to work on a variety of client projects. Applicants should have a minimum of two years' experience. Ref: T2497

### PROGRAMMERS - SYSTEM 38 TRAINING

**CITY** **to £12,000 + MORTGAGE**

Two Programmers with 12 months+ RPGII experience are currently required to complement the expanding development team of this international bank. It would be useful if one candidate could also offer good systems design experience. This is an excellent opportunity to gain valuable System 38 skills and broad financial applications knowledge. Benefits include n/c pension, low interest loans, free life assurance and MORTGAGE subsidy. Ref: D2408

### SYSTEM 38/RPGII

**KENT** **£10,000**

Progressive commercial organisation about to implement online facilities to all departments is able to offer a challenging workload to a Programmer and Analyst/Programmer, wishing to become key members of a friendly team. All new development work will be carried out in-house on an IBM System 38 using RPGII and analysis training will eventually be given to the Programmer. Full benefits package. Ref: D2484

### RPGII to RPGIII

**MIDDX** **£7,000-£12,000**

This System 38 site is heavily committed to the in-house development of commercial systems. To enable them to achieve their long-term aims, they are prepared to offer comprehensive System 38/RPGII training to RPGII professionals. Both positions require a minimum of 12 months' RPGII experience and one position requires good analysis skills. Ref: D2835

### IBM COBOL PROGRAMMER

**CITY** **£11,500 + MORTGAGE**

International bank retaining an IBM 3033 under MVS requires an IBM COBOL Programmer with two years+ experience. Working within a project team, you will be involved in online applications development. Benefits include MORTGAGE subs., low interest loans, n/c pension and BONUS. Ref: M2374

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**CITY** **£6,510,000 + MORTGAGE**

If you have 18 months' IBM COBOL experience and wish to acquire CICS & DL/I skills, this international bank may have the opening you are seeking. You will be programming for online and batch systems together with some maintenance. Good career prospects and usual banking benefits. Ref: M2583

### IBM PROGRAMMER & SENIOR PROGRAMMER

**BERKS** **to £11,000 + MORTGAGE**

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### IBM COBOL PROGRAMMER

**N. LONDON** **£10,500**

Due to further computerisation of their marketing systems, this manufacturing concern has a requirement for an IBM COBOL Programmer. Applicants should possess 18 months+ IBM COBOL experience and preferably some exposure to online systems, although the company are willing to train in CICS & DL/I. Ref: M2581

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**ESSEX** **£9,000 + MORTGAGE**

This leading insurance company is seeking to recruit an IBM COBOL Analyst/Programmer with two years+ experience. Working on IBM 4341 under DOS VSE, CICS & DL/I, the successful candidate will be involved in the development of financial systems. Full training in online and database techniques. Ref: M2360

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**CITY** **to £10,500**

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(B582)

# ANALYSTS/DESIGNERS PROGRAMMERS

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(B507)

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(B582)

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(R224)

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(0404)

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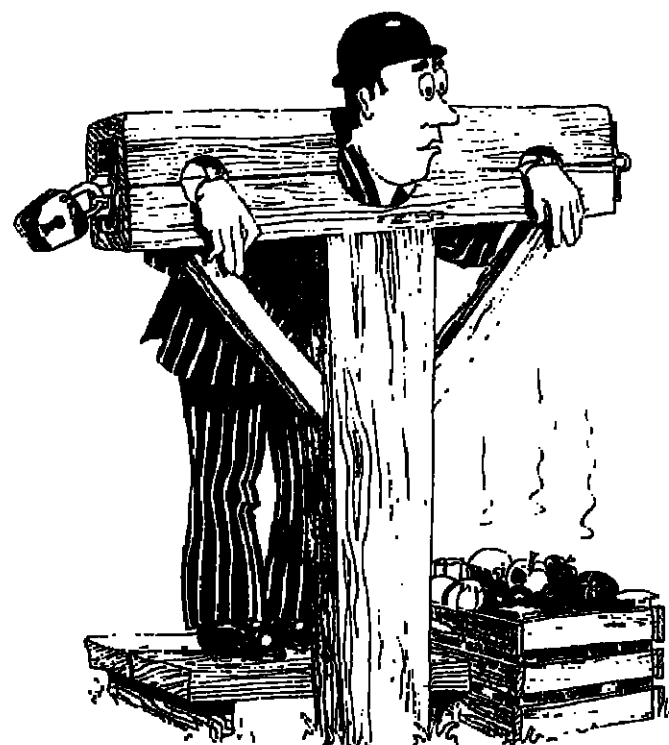
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A highly successful and expanding electronics company involved in avionics and communications, our Client has recently converted to COPICS MRP and other modules, using CICS, DL/I, COBOL, FILETAB and UFO in the development of commercial business systems, and recognises the need for formal data administration in constructing systems for the future. Although they are ideally seeking Computing or Business Studies graduates with some years experience in a business environment, anyone with a lesser qualification but a comprehensive DP knowledge is needed to join a team based in attractive modern premises on the Herts/Essex border, developing computer systems as a means of solving business problems. This is an excellent opportunity to gain COPICS experience with a leading-edge company, including in-house applications of the basic systems.

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Telephone us on 01-405 1220 or 01-405 1260 between 5pm and 8pm on Friday 30th March or Monday 2nd April for a friendly and confidential discussion. Alternatively write with full career details quoting Ref. 275, to: Andrew Millhouse, Deansgate Management Services, 52 Bedford Row, London WC1R 4LX.

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This challenging and rewarding position within an organisation currently investing millions of pounds in information technology is open to candidates possessing at least one of the following skills:

- ★ IMS database administration or database design.
- ★ IMS and/or CICS applications design/programming
- ★ IMS and/or CICS systems programming.

Allied to the above you should be able to demonstrate, or at least wish to develop project co-ordination skills within a dedicated systems programming arena.

If you firmly believe that you are immediately capable of accepting this challenge and are keen to develop your man management skills within a highly visible technical area, then this opportunity is ideally suited.

For further information do not delay in contacting **Adrian Hardy** on 01 935 0671 or **Walton-on-Thames (0832) 224766** evenings or weekends for a private and confidential discussion/interview.

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Even greater expansion of our Data Services Department is underway and we now wish to strengthen our team of computer professionals at our purpose-built data and communications centre in Jeddah. This modern operation supports a large IMS and CICS-based online operation, running on Dual IBM 3033 mainframes under MVS/SP1.3 with JES2, with JES3 currently under development.

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## SENIOR SYSTEMS ANALYSTS & SYSTEMS ANALYSTS

ACP Passenger Service Systems  
Range £18k-£25k Max £29.5k

To support these Project Managers, we are looking for people with less but substantial systems development and installation experience in these same areas.

In addition we require similar people for other areas each of which have their own specialities:

### \* Finance & Administration Systems

You should have experience in systems analysis/design using structured techniques preferably YOURDON. A background in COBOL/CICS/VSAM is essential. Applications include: Personnel Administration, Revenue Accounting, Accounts Payable, Accounts Receivable, Statistics.

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You should have experience in systems analysis, design and programming for online and batch applications, preferably inventory and aircraft maintenance systems with at least three years in IMS DB/DC, PL1, SPF and utilities.

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We need people to be responsible for maintaining the software system at the highest possible level. Major online systems under IMS and CICS are planned to be cut over late in 1984.

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- \* The Network Software Support Group has responsibility for NCP, VTAM, NPIA, NCCP and TSO.
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## DATA BASE ANALYSTS

Range £18k-£25k Max £29.5k

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Experience of IBM systems software, specifically database management systems and data communications systems  
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Contact BOB BOWER, Advising Director.  
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The successful applicants may be drawn from a wide range of backgrounds, but must have real-time or on-line development experience. Ideal, would be a good knowledge of BASIC on VAX or PDP 11s, plus a Banking background.

If you do not fully meet this specification, but are self motivated, an excellent programmer and willing to learn, they could also be interested.

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with exposure to CICS

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We are a Computer Services Company who specialise in the marketing, development, sales, installation, training and support of packaged software for financial management.

Our objective of controlled expansion has now created opportunities for individuals with good communication skills to advance their careers by moving into Consultancy. We regard personal qualities as being as important as Technical ability, particularly as Client support and contact forms an integral part of the Consultant's role. Our standards are high, but we are not slow to recognise potential and therefore offer superb future prospects.

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Specialist Computer Recruitment Ltd

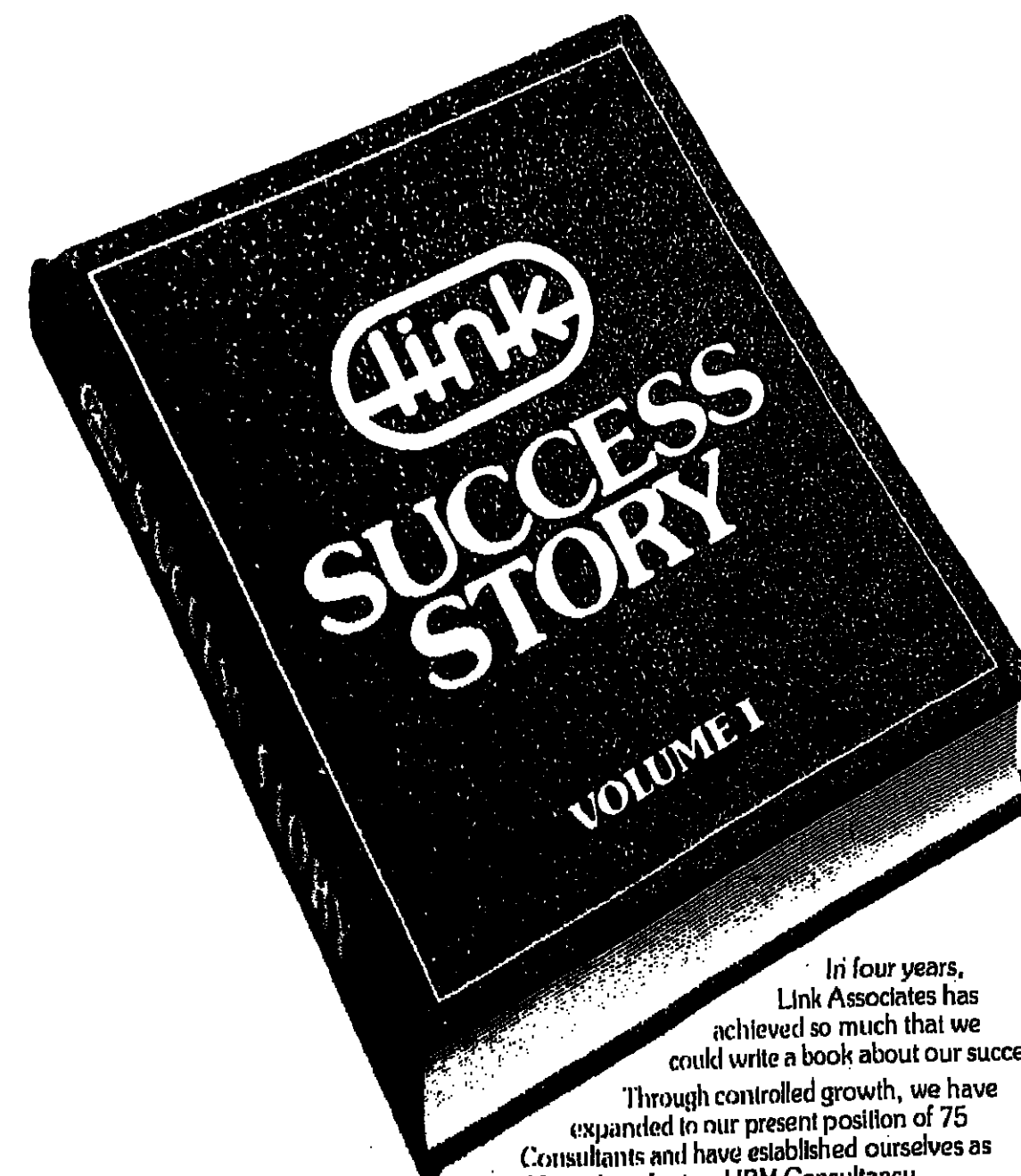
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London W1M 6HS  
01-936 0671/408 0401

**MIDLANDS & INTERNATIONAL**  
35-37 Great Charles Street,  
Queensway, Birmingham B3 3UJ  
021-236 5781

**NORTH**  
International House, 84 Deansgate,  
Manchester M3 3EE  
061-833 0427

**BELGIUM**  
Avenue Louise 327,  
Boite 4, 1050 Bruxelles  
010 322-848 7161/71

**HOLLAND**  
Willemsparkweg 92,  
1071 H.M. Amsterdam  
010 3120-780947



In four years, Link Associates has achieved so much that we could write a book about our success.

Through controlled growth, we have expanded to our present position of 75 Consultants and have established ourselves as a reliable and professional IBM Consultancy.

Another page in our success is our recent move into brand new offices, providing us with the facilities for in-house training and project work.

However, most of the chapters of our success story must be devoted to our staff. We employ a team of above-average, personable technicians who rely on us to provide the opportunities to develop their technical skills and career paths. We are a people company!

### Come and help us write Volume II

We now need to recruit additional permanent staff ranging from Programmers to Senior Analysts, so if you have commercial IBM maintenance experience then you could make a name for yourself with us — one of the top young IBM Consultancies.



To hear more about our company and what we can offer, please ring:  
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Link House, Elgiva Lane,  
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(0494) 784922



## PUBLIC SECTOR APPOINTMENTS

Royal Naval Engineering College  
Manadon, Plymouth

## Applications Programmer

This post presents excellent opportunities to gain experience in a wide range of Computer Systems and applications. The College currently uses a large XEROX SIGMA 6 time sharing system, a number of DEC PDP 11 minicomputers and various microprocessor based systems. The SIGMA 6 is to be replaced in 1984. There are significant graphics facilities including Colour Raster graphics and Vector refresh systems.

The successful candidate will be responsible for application programming tasks, providing detailed advice to staff and students, and supporting and developing the graphics facilities. The main applications use FORTRAN, CORAL 66 and some Pascal in an engineering context together with packages such as GINO-F, PAFEC and MAG. There is also a growing involvement in Real Time Control applications using

MASCOT and RT11/RX11 operating systems.

Candidates should have, or be about to obtain, a degree/HND/HNC or equivalent (including overseas) in Computer Science or a related subject and experience or interests in the above areas.

Appointment as Scientific Officer (E5680-27165) with starting salary according to qualifications and experience. Promotion prospects.

RELOCATION ASSISTANCE MAY BE AVAILABLE.

For further details and an application form (to be returned by 15 April 1984) write to: Scientific Personnel Officer, Admiralty Underwater Weapons Establishment, Portland, Dorset DT5 2JS. Please quote ref: SA/18/FFA.

The Civil Service is an equal opportunity employer.

**Scientific Civil Service**  
Ministry of Defence

(8629)

THE UNIVERSITY  
OF SHEFFIELD  
Computer Officer  
(Information)

The Computing Services offers computing facilities to all departments of the University, and users range from the apprehensive novice to the enthusiastic expert. It is the responsibility of the Information Section to help all these users obtain optimum benefit from the services available, by providing them with appropriate help and information. The Computer Officer (Information) will be responsible to the Information Officer, and will be expected to help with the production of printed and computer-based material and to participate in the Program Advisory role; there may also be opportunities for giving short courses from time to time. We are looking for someone who has not only the technical ability to meet these requirements, but also a sympathetic awareness of users' needs. The post might suit someone who is completing an undergraduate or postgraduate course which includes a significant computer element. Initial salary up to £7,630 a year on scale rising to £8,530 a year.

Particulars from the Registrar and Secretary (Sheffield), the University, Sheffield S10 2TN to whom applications (five copies) should be sent by 18 April, 1984. Quote ref: R08/85.

(8638)

OXFORD UNIVERSITY  
DEPARTMENT OF  
EXPERIMENTAL PSYCHOLOGY  
COMPUTING OFFICER

RS 8 210,710 p.a. (under review). Applications are invited for the post of Computing Officer to a large University Department. Duties include assistance and training in the use of computers such as the PDP 11, and microcomputers for research and for data analysis, the development of software for research, and the instruction of students in programming. The Computing Officer has responsibility for the software and operation of the computers with the Department but not for their hardware. Applicants should have a degree or equivalent in computing or research and have experience in the use of computers in research and have language programming. Further details and an application form will be sent to the Administrator, Oxford University, Department of Experimental Psychology, 1, South Parks Road, Oxford OX1 3UD no later than 30 April 1984.

(8606)

West London Institute  
of Higher Education  
Department of Business  
and Management Studies  
SENIOR LECTURER  
and LECTURER II/  
SENIOR LECTURER

Applications are invited for the above posts in the Department of Business and Management Studies. Candidates should be able to teach computing to degree level and should have relevant professional experience in commerce or industry. The senior appointee will act as a course leader in an HND in Computer Studies currently in preparation. The development of consultancy and research interests will be specifically encouraged. Salary will be in accordance with the Senior Lecturer and Senior Lecturer II scales for Burnham FE Teachers (£10,683-£13,443 and £7,215-£10,443 respectively, plus an Over London Allowance of £845 p.a.).

Application forms and further details may be obtained from the Vice-Principal, WILHE, Lonsdale House, Borough Road, Lewisham, Middlesex SE13 6DU (Tel: 01-858 6741, ext. 277). Completed forms to be returned by Friday, April 13, 1984.

(8674)

## Project Team Leader

£10,539-£11,364 p.a.

The Council currently uses two ICL 2966 computers with an expanding network of ME28s, DRS micro and over 180 terminals. Both the DME and VME operating systems are supported.

The Project Team Leader will head a team of analysts and programmers supporting and developing our Payroll and Personnel systems.

Applicants must have:

- 8+ years' experience with a thorough grasp of analysis and design;
- Designed and implemented at least one large system;
- Practical knowledge of VME;
- Ability to lead and motivate a team.

In addition, knowledge of IDMS, TPMS and DB2 with experience of Payroll/Personnel systems would be advantageous.

For further information, contact Ian Pearce on Telford 71795 or write to The County Treasurer, County Hall, Telford, Shropshire TF1 1AB, for an application form and job description. Closing date 14th April 1984.

(8638)

**Cornwall**

UNIVERSITY COLLEGE HOSPITAL  
The Chemical Pathology Department of this Central London Teaching Hospital has the following vacancies

**SENIOR SYSTEMS DESIGNER/PROGRAMMER**  
SALARY: £9,409-£11,319 plus proficiency allowances where appropriate

This post requires an experienced computer specialist who possesses drive and initiative, is prepared to be flexible and is capable of working to time schedules. The successful candidate will be expected to adopt a disciplined professional approach and take responsibility for both the technical and day-to-day managerial aspects of the operations area, under the general direction of the Head of Department.

The job offers considerable scope for experience in designing, programming and implementing a computer system in a real-time environment. Ref. No. DB19

**JUNIOR SYSTEMS DESIGNER/PROGRAMMER**  
SALARY: £8,446-£10,094 inclusive plus proficiency allowances

This post offers, under the supervision of the Senior Systems Designer, the opportunity to broaden experience already gained in designing, writing and implementing programmes, in a new, interesting and worthwhile environment.

Candidates will be expected to have a good grounding in programming and some experience of system design and be adaptable in the use of this knowledge. Ref. No. DB54. Benefits include season ticket loan scheme, social club facilities and easy access from underground and mainline stations.

For informal discussion please contact Professor Flynn on 01-387 9300 in the Chemical Pathology Department.

For application form and job description please contact the Personnel Department, University College Hospital, Gower Street, London WC1E 6AU, or telephone 01-387 2374 (24-hour service) quoting the appropriate reference number. Closing date: 12th April 1984

(8621)

**BLOOMSBURY**  
Health Authority



CITY OF LONDON

## Senior Systems Analysts

Salary up to £13,500 p.a.

The City Corporation is the highly prestigious local authority serving the square mile at the heart of the capital. A computing, office automation and telecommunications strategy to take the Corporation through the 1980's is now being put into effect, including these 2 newly created Senior Analysts posts.

We are looking for people with several years experience, which includes all aspects of analysis and design work, and experience of large systems. The successful applicants will be expected to take responsibility for projects, and to supervise the work of other analysts and programmers.

Benefits include generous holidays, superannuation scheme, season ticket advance, subsidised staff restaurant and resettlement advances in approved cases.

Application forms obtainable from Administration Officer, Chamberlain's Department, Guildhall, London, EC2P 2EJ. (Telephone 01-806 3033 extension 2360).

For further details of the post ring Roger Marshall, Computer Services Director on extension 2307.

(8650)

HENLEY - THE MANAGEMENT COLLEGE  
INFORMATION MANAGEMENT

THE POST: To teach, use and apply information management systems to middle and senior management and MBA students. Must be familiar with use and limitations of high-technology systems in business. Part-time appointments could be considered.

QUALIFICATIONS: A good first degree in an appropriate discipline, preferably a higher degree and evidence of relevant experience. The college has a link with Brunel University and candidates should be able to supervise postgraduate students.

A competitive salary in higher education, probably in the range for senior lecturer in universities, USS and removal allowance.

Detailed c.v. please to: Professor T. Kempner (Principal) Henley, The Management College, Greenlands, Henley-on-Thames, Oxon RG9 3AU

(8607)

## PUBLIC SECTOR

## Operations Support Assistant

£7,818-£8,523

Kingston-upon-Thames

An experienced computer operations professional is required for the Computer Services Division.

The Council operates a Sperry 1100/82 mainframe with an extensive terminal network spread throughout the county, and a Redifusion key-to-disc system for data entry purposes. The successful applicant will be involved in the following areas of work under the supervision of an Operations Support Officer:

- 1 Maintenance of operations documentation and procedures
- 2 Acceptance testing new systems - applications, software and hardware
- 3 Programming the key-to-disc system
- 4 Maintenance of resource control procedures
- 5 Assisting with terminal network maintenance
- 6 Preparation of JCL for live and utility runs

The post requires at least three years' operations experience in a large computer installation and the ability to produce clear and concise written procedures. Knowledge of OS-1100 JCL would also be an advantage. This is a re-advertisement and previous applicants need not apply.

Please contact Kevin Pike at the Computer Services Division, County Hall, Penrhyn Road, Kingston-upon-Thames, Surrey KT1 2DN (01-548 1050, ext 3478), for application form and job description, or telephone Steve Tuttle on 01-548 1050, ext 3048, for further details. Closing date 16 April, 1984.

(8675)

**SURREY**  
COUNTY COUNCIL

## GROUP ENGINEER

(Computer and Management Information)

Grade PO2 (1-5) salary scale £12,408-£13,725

The holder of this post will be responsible to the Principal Assistant County Surveyor (maintenance and services). The vacancy arises because the present holder is leaving to take up a post outside Local Government. His replacement will be responsible for managing the computer services group to provide technical and administrative assistance in the department and for formulating policy and ensuring the expansion of computer use for technical and management information systems.

Considerable involvement has been made in the I.C.L. computer hardware by the County Council and in specialised hardware for the department. Application software currently supported ranges from engineering analysis and design to management information systems.

Applicants will need to show considerable management ability and be either an engineer with computing experience or someone with considerable computing experience and knowledge of Highway Engineering.

Removal, resettlement and lodging allowances are payable in approved cases.

A job description and application form are available from the County Surveyor, Northampton House, Northampton. Telephone Northampton 34833, ext 5308.

Closing date for applications is April 25th, 1984.

(8671)

**Northamptonshire**  
Highways and Transportation

UNIVERSITY OF LEICESTER  
DEPARTMENTAL RESEARCH SCHOLARSHIPS

## SCHOLARSHIP IN COMPUTING

Applications are invited for 5 Postgraduate Departmental Research Scholarships tenable at the University of Leicester from October 1, 1984.

Scholarships tenable for up to 3 years are available in each of the following Departments: Computing Studies Unit, Economics, Geography, History; a further scholarship tenable for a maximum of 2 years is available in the Department of the History of Art.

Scholarships carry an annual maintenance award of £2430 (under review) plus remission of fees where scholars are to register for studies at the University. Departmental Research Scholars will be expected to carry out 10 hours' tutorial supervision (or 18 hours' laboratory demonstration) per week for which payment will be made at the rate of £2.85 per hour (tutorial supervision) or £4.80 per hour (laboratory demonstration). These rates are currently under review. Scholars undertaking research for the first time will not be expected to carry out more than 8 hours' supervision or demonstration per week in their first year.

Further details and application forms are available from the Registrar (Departmental Research Scholarships), University of Leicester, University Road, Leicester LE1 7RH to whom applications should be returned by May 4, 1984. When requesting further details please specify the subject area of proposed research.

(8681)

LONDON BOROUGH OF BUTTON  
EDUCATION DEPARTMENT  
CARSHALTON COLLEGE OF FURTHER EDUCATION

Nightingale Road, Carshalton, Surrey SM5 2EJ  
Telephone 01-847 0021/7

Required for September 1, 1984.

## Lecturer II

To teach Computer Studies and Data Processing to BTEC National Diploma.

Salary: £7,215 to £11,568 per annum, plus £845 London Allowance.

Application forms and further particulars from the Principal of the College, to whom completed forms should be returned within fourteen days of the appearance of this advertisement.

(8602)

The Hatfield Polytechnic  
PROJECT LEADERS

to £13,700

AND

PROGRAMMER/ANALYSTS

to £10,500

The Computer Centre provides a service for teaching and research throughout the Polytechnic. It has substantial computer facilities spanning DEC mainframes, minis and micros connected by a Cambridge Ring. Demands on the service are increasing rapidly and we need to strengthen our expertise in specific areas.

A PROJECT LEADER is required to take charge of mainframe and micro operating systems and utilities. Experience of VAX/VMS and UNIX is an advantage but not essential.

A PROJECT/GROUP MANAGER is required to co-ordinate software tools and language systems and to head our efforts in providing help for users.

PROGRAMMER/ANALYSTS are required in both our systems and applications areas. In systems, applicants should have experience in programming in an operating system or communications environment. In applications, a desire to help users, backed by sufficient computing expertise, is essential.

For further details and information please telephone G. D. Everitt, Hatfield 68100 ext. 504, or write to: The Staffing Officer, The Hatfield Polytechnic, P.O. Box 109, College Lane, Hatfield, Herts AL10 9AB, quoting reference 751.

Closing date, April 18th, 1984.

(8628)

WARRINGTON BOROUGH COUNCIL  
HOUSING SERVICES DEPARTMENT

## INFORMATION SYSTEMS MANAGER

(Grade PO1 (1-4) - £10,242-£11,052)

Applications are invited from persons with suitable experience for the above senior appointment reporting to the Chief Housing Officer.

The Borough operates an expanding central systems base on a large ICL mainframe. Additionally the distribution of computer systems in the Housing Services Department is a major development area, which includes mini and micro applications.

Self-motivation, discipline, good communication and proven high regard of data processing standards are essential plus proven ability to control developments from feasibility through to operation.

Professional, technical and specialist experience must be supported by appropriate qualifications and will be reflected within the above salary range. A casual user car allowance is payable.

Application forms and job description are available from:

The Personnel and Management Services Officer  
Warrington Borough Council  
Town Hall, Bank Street, WARRINGTON  
(Telephone: Warrington 35891, Ext. 32)

The completed application forms should be returned by April 18, 1984.

(8681)

FINANCE DEPARTMENT

## ASSISTANT DEVELOPMENT OFFICER

£10,572-£11,166 Inc. p.a.

The Data Processing Division is currently undertaking a major programme of development throughout the Council involving the introduction of new systems and revision of existing systems. This post plays a key role in the programme and is concerned with detailed examination of systems, recommendations for computerisation and carrying out implementation. It provides an excellent career opportunity for someone who has at least 3 years' experience of working with computers including systems analysis and wishes to develop their experience of systems analysis and implementation.

The Council uses IBM 4341 mainframe facilities as well as IBM PC micro computers.

Form from Director of Finance, Municipal Offices, Twickenham TW1 3AA (01-891 3411, ext. 281) to be returned by April 13th, 1984.

London Borough of  
**RICHMOND UPON THAMES**

(8642)

SURREY EDUCATION COMMITTEE  
BROOKLANDS TECHNICAL COLLEGE  
Heath Road, Weybridge, Surrey  
DEPARTMENT OF TECHNOLOGY

## Lecturer II - Computing

to teach Systems Analysis/Design and structured COBOL for BTEC National/Higher National Computer Studies.

Salary Scale: Lecturer II: £7,215-£11,568 per annum plus £226 per annum London Fringe Area allowance.

Commanding salary dependent upon qualifications and experience. Generous relocation expenses in approved cases.

Further details and application form from the Principal to be returned by TUESDAY, 10th APRIL, 1984.

(8677)

UNIVERSITY OF ABERDEEN  
THE DEPARTMENT OF NATURAL PHILOSOPHY AND THE DEPARTMENT OF BIO-MEDICAL PHYSICS AND THE DEPARTMENT OF CHEMISTRY  
LECTURES IN INFORMATION TECHNOLOGY

Applications are invited from suitably qualified persons for a Lectureship in Information Technology. It is expected that the person appointed will be a physicist or engineer of proven research ability with experience in information technology. The successful applicant will hold the lectureship jointly in two subjects two departments and will be expected to play a major role in the development of courses in information technology and will be expected to act as a tutor in the preparation of the computer course, BSc in Information Technology (Medical Physics), which will be in the Department of Natural Philosophy. The person appointed will be expected to undertake research in the Department of Natural Philosophy.

Salary will be on the scale £7,180-£14,125 per annum with appropriate pension. Further particulars and application forms from The Secretary, The University of Aberdeen, to whom applications should be sent by 30 April, 1984.

(8636)

## CAD/CAM SOFTWARE DESIGNERS

Silicon Valley, California

Automation Technology Products are seeking to recruit experienced and recently graduated computer scientists (M.Sc, Ph.D, Mechanical Engineer/Maths/Computer Science).

Knowledge of the latest research and developments in 3D Solid based Mechanical CAD/CAM, Computer Graphics or associated database management technology is essential.

Professional assistance with relocation and immigration will be provided.

Salary range \$30,000 to \$50,000 plus equity.

Interviews will be held in London, Manchester, Cambridge and Edinburgh in April.

For appointments contact H. Robinson. Telephone number 09363 77419.

(8694)

## SYSTEMS PROGRAMMER

Brand-Rex Limited are one of the leading specialised cable manufacturers. The computer department has just commenced the introduction of manufacturing systems based on ICL's Omac 29 package and therefore requires a Systems Programmer within data processing.

The appointed person (male/female) will be required to have had at least three years' experience as a programmer/analyst or senior programmer within an ICL environment. Preferably MC29 knowledge of Omac 29 or manufacturing systems together with 'on-line' processing, particularly TPS and range Cobol is essential.

Excellent working conditions, generous holiday entitlement, free life assurance and contributory pension fund are part of the overall remuneration package.

Application forms from Personnel Department, Brand-Rex Limited, Viewfield Industrial Estate, Glenrothes, Fife KY6 2RD. (0592) 772124.

(8680)

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TEL: 01-555 2844 (4 Lines) Emp. Adv.

(8690)

## COMPUTER LIAISON OFFICER

£11,952-£12,894 p.a. incl.

The Finance Department is a major user of the Council's IBM 4341 (shortly to be updated to 3083E) mainframe computer and is also rapidly developing local systems through IBM personal computers and advanced software.

This new post has been created within the department, the principal duties of which will be to co-ordinate and progress new systems, to assist in the maintenance of existing systems and to provide some technical support to finance department users.

Candidates should have a background of work experience in a financial environment, preferably Local Government, and should be able to demonstrate significant personal involvement in the development of computer-based systems.

Possession of skills in personal computing techniques would be an advantage.

**The Royal Borough of KENSINGTON AND CHELSEA**

Application forms and job profile quoting ref. CW 771X from the Personnel Service, Town Hall, Horton Street, London W8 7HX. Tel: 01-837 8562 (24-hour answering service). Closing date for application: 13 April, 1984.

We are an EQUAL OPPORTUNITIES EMPLOYER

(8620)

**CITY OF SHEFFIELD**  
OPPORTUNITY IN INTERNAL AUDIT  
GROUP AUDITOR  
PO2(h) £13,725-£14,709

Sheffield is one of the largest Metropolitan Districts utilising the considerable computer facilities over a wide range of services. There has and continues to be, a rapid expansion of these facilities which are based on an ICL 2986 VME installation with an extensive terminal network (DRS, 7900, etc.).

The speed of advancement combined with the growth and complexity of the applications is now such that specialist computer expertise is required to enable the Internal Audit Division to discharge properly its responsibilities in this vital important area. In order to meet this need the above post has been created as part of a major review of the structure and approach of the Division.

The post-holder will lead a small but specialised team and be directly responsible for the audit of computer services. Particular duties will include the review of systems, control procedures and the use of resources as well as the implementation of a training programme for service auditors.

In appropriate cases the Council will provide assistance towards removal expenses and a temporary lodging allowance may be available.

PERSONS WHO FEEL THEY HAVE SUITABLE EXPERIENCE AND WHO COULD MAKE A POSITIVE AND EFFECTIVE CONTRIBUTION TO THE INTERNAL AUDIT FUNCTION AS PART OF THEIR CAREER DEVELOPMENT SHOULD APPLY BY LETTER GIVING FULL CAREER, PERSONAL DETAILS AND QUOTING THE NAME AND ADDRESS OF TWO REFEREES TO THE CITY TREASURER, TOWN HALL, SHEFFIELD S1 1UL. CLOSING DATE 12th APRIL. PLEASE ALSO QUOTE WHERE YOU SAW THE POST ADVERTISED.

Sheffield City Council is an Equal Opportunities Employer.

(8637)

**Cheshire Education Committee**  
NORTH CHESHIRE COLLEGE

We are seeking to appoint both full-time and part-time lecturers in







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Telephone: 061 496 1105  
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**FERRANTI**  
Computer Systems

Thursday, March 29, 1984



Schoolchildren studying O' and A' levels are to have new courses.

## Schools' policy shifts tack

by John Kavanagh

GOVERNMENT policy on technology in schools will enter a second phase on Monday, with the emphasis moving away from Basic programming and educational games towards the use of computing in industrial control.

Having put a microcomputer in every secondary school and most primary schools, the Department of Trade and Industry is launching the British School Technology scheme. The scheme will advise local education authorities on the introduction of technology courses to O level and A level school children.

It has the backing of the Department of Education and Science, the Department of Employment and the Manpower Services Commission.

Educational materials for teachers and classrooms are already being produced by the Open University in the form of micro-electronics teaching packages and a computer called Diamond (Digital Electronic System Made of Nifty Devices).

Diamond is a £70 microcomputer with switches, lamps, a buzzer, a stepper motor and sensors for light, heat, tilt and magnetism. It is programmed in an assembly-type language to set switches, light lamps and so on.

Diamond is already on trial in secondary schools, and has been quite a success, according to Helen Boyce, micros in schools project manager at the Open University. "Some schools have developed their own interfaces and got Diamond to control washing machines

and so on," she says. "So far children have learned how to program in Basic. Now they can learn how their computer works."

The British School Technology scheme, to be announced by information technology minister Kenneth Baker, is part of the government's aim to move emphasis in schools away from pure academic qualifications towards an appreciation of industry.

The Open University has introduced a package for teachers to help them evaluate software products. It includes examples in the form of school programs and the Logo educational language. The first versions are for Apple and Research Machines computers. Sinclair and Acorn/BBC versions will follow. Prices start at £49.

## IBM unveils magnetic tape drive

by Keith Holder

AFTER 18 months of delays and rumours, IBM has unveiled its Dora cartridge tape subsystem, the first of its latest generation of magnetic tape drives.

Called the 3480, it operates at twice the speed of current IBM tape units, and is designed to answer users' demand for a more compact, faster device for tape back-up of large disc storage devices, like IBM's 3380.

The tape can store 200 million bytes, using 18 tracks and a specially designed thin film head. The drive is supported only by IBM MVS and MVS/XA operating systems.

The 3480 is smaller than its predecessor, IBM says that two new drives take up less than half the floor space needed by the older

3420 models and require 70% less power and cooling.

John Curran, vice-president of National Advanced System, says: "This product must have had the longest gestation period of any IBM product. Consequently, its competitors have had time to develop plug compatible rivals which will hit the market very quickly."

He adds that NAS will be one of these.

Storage Technology has its 4680 rival in the market, which has a greater degree of in-built flexibility and will support all IBM main-frame operating systems, says a company spokesman.

The spokesman says of the IBM subsystem: "The only surprise about this product is the price, which is rather high."

A spokesman for BASF confirms

that, though it is among the manufacturers of plug compatible rival systems, it was involved in discussions with IBM over the tape technology used in the 3480. He says that BASF expects to have a plug compatible product in the market in time for IBM's first deliveries.

Purchase price of the 3480, comprising one A22 controller and eight B22 drives, is £146,717. Discounts start at 4% for five units, up to 16% for 20 units or more.

Deliveries are scheduled for the first quarter of 1985.

There is intense industry speculation that IBM is to announce a younger brother for its System 36 small business system on April 3. That date coincides with the Hannover Fair in Germany.

The new model is expected to be a "desk side" version.

## Pentagon calms UK export fears

by George Black

A SENIOR Pentagon official has accused Europeans of overreacting to US proposals to tighten exports of high technology to the East bloc.

Richard Perle, assistant secretary of defence for international security policy, said the amount of trade involved is insignificant. His comments were made during a two-way video conference between London and Washington last week, and came on the day that President Ronald Reagan gave the Pentagon the right to review high technology exports to 12 non-Communist countries suspected of diverting goods to the Soviet bloc. The countries were not named.

Perle said he thought it missed the point to suggest that export controls are an invasion of UK sovereignty.

"Most of the complaint about extra-territoriality is in fact a complaint about the terms and

conditions imposed on export licences, which are freely entered into," he said.

He suggested that the over-reaction is some "confusion" regarding US government attempts to use export restrictions to gain economic advantage for US companies.

Perle rebutted criticisms of proposed controls on the export of personal computers, which he said are becoming increasingly powerful, and have obvious military implications: "We now are using Apple II computers to target nuclear weapons - Apple II computers with the standard software."

Perle said the Defence Department believes that the Soviets remain closely tied to Western technology in critical areas, but they have not been able to make use of acquired technology to create their own base.

For that reason sensible controls

are necessary, he said. He expressed his faith that Cocom, the Western co-ordinating committee for export control, will find the middle ground between "no controls at all and controls that are obviously unworkable and unenforceable".

Perle said the US would press for switching systems, particularly those with stored program features, should be on the Cocom restricted list.

Perle maintained that the US has the right to restrict the flow of technology to Soviet bloc countries, and if necessary, the US could cease licensing the most sensitive technologies.

He hopes, however, for an "understanding of the dilemma we face, and a recognition that the effort to maintain some residual control over technology once it leaves our shores is vital to a free flow of high technology between the US and its friends abroad".

## Too many software firms pass \$1m mark for ICP

by George Black

AWARDS for selling \$1 million worth of software were not presented at the ICP "Industry Oscars" yesterday. For the first time in 13 years of the ceremony, the organisers decided there were too many for individual acceptance. So the 50 winners in this, the lowest category, had to collect their prizes afterwards, without applause.

A spokesman says: "It could have taken all night - especially if all of them had wanted to explain how they couldn't have done it without Granny's help."

It is the measure of how the software business has now taken off that a mere \$1 million no longer merits special attention. This year there were four awards for over \$100 million, six for \$50 million and 13 for \$25 million.

In the classes for \$1 million, \$5 million and \$10 million, there was a total of 92 winners. When ICP thought up the idea in 1971, only 29 firms passed the \$1 million mark. At this week's ceremony in the Barbican, 85 firms took part which together had netted receipts of over \$1.5 billion.

The software industry's leader, MSA, had successes in the \$100 million, \$50 million and \$25 million categories. So did Computer Associates, which also launched

four new products, each passing the \$1 million mark.

Not satisfied with gaining the first \$250 million award last year, Cincom applied to ICP to create a new class to accommodate its new record of \$300 million with the database system, Total.

Top UK contribution was the banking system, Midas, from BIS,

which came in the \$50 million bracket and represented a personal triumph for marketing manager John Wills.

Another UK banking expert, Arbat, though now owned by the US Control Data Corporation, had three individual salesmen with over \$1 million each to their credit, all for the same system, Series 700.

## Survey finds trainees filling staff gaps

by John Kavanagh

COMPUTER installations are turning to trainees to meet a staff shortfall of 10% - but that shortfall will double in the next two years.

The emerges from a National Computing Centre survey of 500 UK installations.

The good news is that there was a 10% increase in the number of trainees on last year. The bad news is that in Scotland and Northern Ireland

"The south of England will not cover its staff shortages unless it more than doubles its training levels," says the survey report.

The survey shows there were 110,000 analysts, programmers and analysts/programmers, with an 11,000 shortfall. But users expect the shortfall to double in two years' time, with analysts/programmers being in particularly short supply.

Meanwhile a survey by Reward Regional Surveys shows that computer staff pay rises were well up

on the national average for executive and professional staff last year - and 11% of computer people now earn over £18,000. Computer staff had 8% rises last year compared with the average 6.3%.

The demand for analysts/programmers is shown by their 12.6% basic salary increases. Senior systems analysts got 12.1% and operations managers 11.4%.

Programmers were less prized, with 7.4% rises. At the top of the computer department, data processing managers had rises of

8.3% and computing managers 5.4%.

Average salaries were £15,377 for computing managers, £13,200 for data processing managers, £12,500 for operations managers, £10,885 for software specialists, £11,865 for senior analysts, £9,863 for analysts, £9,500 for senior programmers, £9,184 for analysts/programmers and £7,626 for programmers.

The best paid industries were computer services, distribution and mechanical engineering.

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